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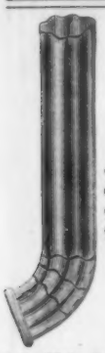

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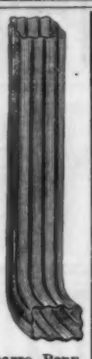

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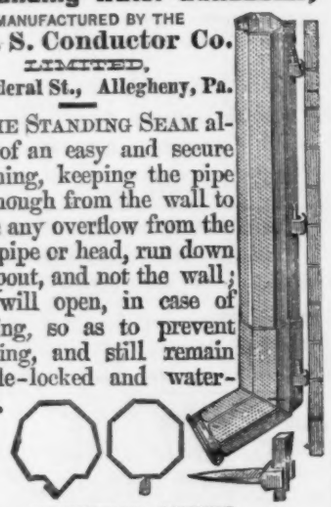

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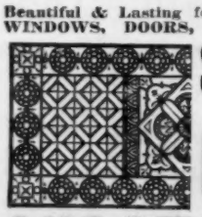

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Manufacturers of Decorative Articles in Metal.

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Sent on receipt of three two-cent stamps.
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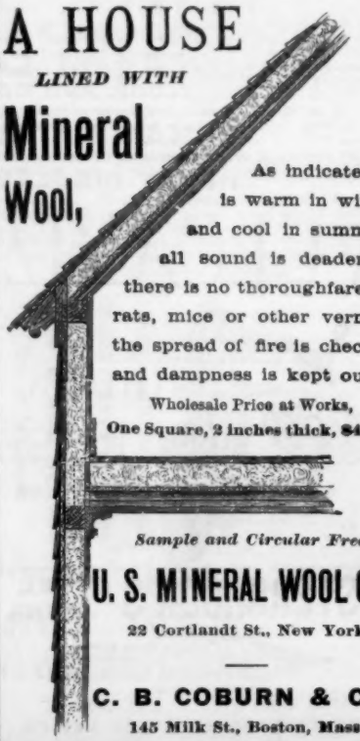
Mineral Wool,



As indicated, is warm in winter and cool in summer; all sound is deadened; there is no thoroughfare for rats, mice or other vermin; the spread of fire is checked and dampness is kept out.
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Sample and Circular Free.
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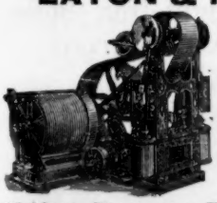
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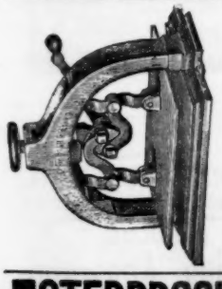
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ESPECIALLY ADAPTED TO
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IT IS POSITIVELY FIRE-PROOF.
WIRE LATHING possesses the following qualities:
IT IS NOT COSTLY.
IT IS EASILY AND CHEAPLY APPLIED.
PLASTERING ON THE WIRE LATH WILL NOT CRACK.
THE LATH WILL NOT CORRODE.
The plastering, when applied, clinches on both sides of the wire, forming a double surface.
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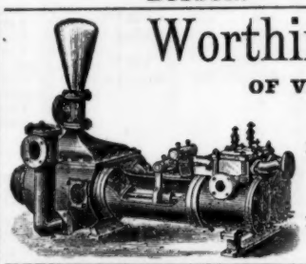
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HANOVER FIRE INSURANCE CO.

Cash Capital	$1,000,000.00
Reserve for Re-insurance	635,741.16
Reserve for all other Liabilities,	96,655.57
Net Surplus	832,744.56
Total Assets, January 1, 1883	2,565,141.29

BUILDING MATERIALS.
Reported for the American Architect and Building News.

BRICK.—₱ M.	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago. (Prices to Builders and Contractors.)	Philadelphia. (Prices to Builders and Contractors.)
Common: *Cargo afloat.*				
Pale	$2 50 @ $3 50	Eastern	Building Brick	Hard
Jersey	4 50 @ 5 25	7 50 @ 8 00	6 50 @ 7 50	8 00 @ 8 50
Up River	5 00 @ 5 75	Bay State Hard		Salmon
Haverstraw Bay	5 75 @ 6 25	9 00		5 00 @ 6 00
" 1st	6 25 @ 6 50	Domestic Com.	Indiana Pressd	Stretchers
		8 00 @ 9 00	16 00 @ 28 00	11 00 @ 14 00
		Domestic Face	St. Louis Fronts	Pressed
		19 00 @ 20 00	25 00 @ 30 00	20 00 @ 24 00
Fronts:		Philadelphia		
Croton, Brown	13 @ 14 00	40 00 @ 45 00		
" dark	14 @ 15 00	Phila. mould		
" red	14 @ 15 00	50 00 @ 80 00		
Chicago pressed			22 00 @ 35 00	
Chicago Moulded			65 00 @ 350 00	
Baltimore	37 @ 41 00		50 00 @	
Glens Falls — white	30 @ 35 00	Glens Falls		
Philadelphia	@ 27 00	25 00 @ 26 00	42 00 @	
Trenton	@ 27 00		40 00 @	
Milwaukee		Glens Falls	25 00 @	
Moulded:		Mould.	60 00 @ 100 00	
Clark's Glens Falls — Red	25 00 @ 27 00	30 00 @ 35 00	30 @	
" — White	30 00 @ 35 00	35 00 @ 40 00	35 @	
White " Mold,	45 00 @ 60 00	45 00 @ 60 00	55 00 @ 65 00	
Enamelled: *Imp.*				
Enamelled (edge.)	85 00 @ 100 00	@	@ 100 00	Dom. @ 70
Enamelled (edge and end)	90 00 @ 115 00	@	@ 125 00	@ 85
CEMENT, LIME, etc.—(₱ *cask.*)				
Chicago Lime in bulk			65 @ 75	
Wiscon in "			80 @ 90	
Rosendale Cement	80 @ 1 00	@ 1 50	*Not Sold.*	1 25 @ 1 65
Utica, Akron, Buffalo, Louisville, Milwaukee	*Not sold.*	*Not sold.*	1 00 @ 1 25	*Not sold.*
Portland (English)	2 60 @ 3 10	@ 3 20	2 75 @ 3 00	2 30 @ 3 50
" (Saylor's Am.)	2 05 @ 2 40	2 50 @ 3 00	2 75 @ 3 00	2 50 @ 3 00
" (Dyckerhoff)	2 75 @ 3 15	3 00 @ 3 50	3 25 @ 3 75	3 00 @ 3 25
" (Lafarge)	3 50 @ 3 75	*Not sold.*	3 75 @ 4 25	4 50 @
" (Star)	2 76 @ 3 00	*Not sold.*	*Not sold.*	*Not sold.*
K. B. & S. (Eng.) Portland	2 85 @ 3 10		3 35 @ 3 50	3 00 @ 3 25
Burham " "	2 60 @ 2 80		3 15 @ 3 35	2 75 @ 3 00
Vorwohler	2 65 @ 3 25		3 00 @ 3 25	
German (Fewer)	2 50 @ 2 70	3 15 @ 3 35	3 15 @ 3 35	
" (Alsen)	2 50 @ 2 80	3 00 @ 3 50	3 15 @ 3 35	2 90 @ 3 25
Scientific		1 65	*Not sold.*	
Hydraulic Lime of Teil	3 50 @ 4 00		*Not sold.*	
Roman	2 75 @ 3 00	@ 3 20	2 75 @ 3 25	3 25 @ 3 50
Keene's coarse	5 00 @ 6 00	@ 7 50	7 50 @ 9 00	6 50 @ 7 00
" fine	9 25 @ 10 25	@ 11 50	11 00 @ 12 50	11 50 @ 12 00
Lime:				
Rockland and Rockport, (Com.)	@ 1 00	@ 1 10	*Not sold.*	1 00 @ 1 25
Rockland and Rockport, finish	@ 1 20	@ 1 15	*Not sold.*	
State, com. cargo rates (nom.)	75 @ 80	*Not sold.*	*Not sold.*	*Not sold.*
State, finishing "	@ 1 00	*Not sold.*	*Not sold.*	*Not sold.*
Plaster of Paris (calcined.)	1 30 @ 1 35	1 70 @ 1 90	@ 1 75	1 60 @ 2 25
" (casting)	1 50 @ 1 65	@ 2 25	@ 2 00	2 25 @ 2 50
Hair (Cattle) ₱ bush	21 @ 23	@ 30	30 @ 35	22 @ 30
" (Goat)	30 @ 35	@ 30	35 @ 40	@
Sand, ₱ load	1 00 @ 1 25	@ 1 50	100 @ 1 25	75 @ 1 50
STONE. (₱ *cubic foot, rough.*)				
Granite: (*Maine*)		@ 60		
Limestone:				
Bedford	@ 1 00	95 @ 1 00	50 @	3 75 @
Joliet	@		35 @ 55	
Lemont	@		35 @ 60	
Serpentine			80 @ 90	

(Continued on page vi.

10

"MORTON'S METAL"

(Registered Trade-mark, May 1st, 1883.)

Cable and Champion Sash-Chains

and Patented Attachments.

The most **RELIABLE** and **CHEAPEST** article in the market for suspending

Window-Sashes.

HAS GREAT TENSILE STRENGTH,

Can be easily applied to any window, and gives SATISFACTION wherever used. Samples sent to any ARCHITECT free on application. Now in use in all the leading cities throughout the United States.

FOR A SASH OF 250 LBS.

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65 ELIZABETH ST., NEW YORK.

BUILDING MATERIALS.	New York. (Wholesale Prices.)	Boston. (Prices to Builders and Contractors.)	Chicago.	Philadelphia
Foundation:				
Dimension	@	5 00 ₱ ton	20 @ 28	30 @ 5 00
Block	@	4 60 ₱ perch	8 50 ₱ cord.	50 @ 6 00
Rubble	@	1 25 @ 1 50	8 50 @	
Bluestone: (₱ *sq. ft.*)				
Sidewalk	30 @ 5 00	40 @ 1 75	75 @ 1 00	70 @ 90
Planed	50 @ 6 00	75	50 @ 1 00	1 10 @ 1 25
Sandstone.				
Longmeadow		75 @ 85		
Brown (Connecticut)	1 00 @	1 25 @ 1 45	1 50 ₱ cub.ft.	
Amherst	1 00 @	90 @ 1 00	55 @ 65	
Berea	75 @ 1 00	80 @ 90	45 @ 55	70 @ 90
Berlin	75 @ 1 00	80 @ 90	55 @ 65	
Bay of Fundy	@ 1 00	*Not sold*	*Not sold.*	
Belleville	80 @ 1 25	1 25 @ 1 35	"	
New Brunswick	@ 1 00	90 @ 1 00	"	
Caen	@	@ 2 00	"	
Marble:				
Lee, Mass.	@	1 75 @ 2 50	*Not sold.*	2 00 @ 2 50
Rutland, white	@	@ 3 00	3 50 @ 5 00	2 25 @ 2 50
Sutherland Falls	1 25 @ 1 75	@ 2 00	3 50 @ 5 00	1 50 @ 2 50
Glens Falls, black	@	2 00 @ 3 00	*Not sold.*	4 00 @ 4 50
Italian, blue-veined	@	50 @ 60	@ 4 40	—— @ ——
" Sienna	@	3 00 @ 3 50	*Not sold.*	3 25 @ 6 50
Tennessee, red	@	1 25 @ 2 50	@ 4 00	2 00 @ 3 00
" Knoxville	@	85 @ 90	@ 4 00	@ 1 50
Pennsylvania, blue	@		*Not sold.*	2 23 @ 2 50
Vermont, white	@	1 50 @ 2 00	3 50 @ 5 00	
Slate:				
Roofing, (₱ *square*)	@			
" green	7 00 @ 8 00	4 50 @ 7 00	6 25 @ 8 10	@ 7 00
" purple	7 00 @ 8 50	5 50 @ 6 50	@ 8 60	@ 7 00
" red	@ 15 00	13 00 @ 14 00	—— @ 16 00	5 00 @ 5 75
" black, Lehigh	—— @ ——	*Not sold.*	7 20 @ 7 60	5 00 @ 5 75
" " Chapmans	—— @ ——	*Not sold.*	7 30 @ 8 00	6 00 @ 6 25
Tiles, Am. ₱ M.	@		*Not sold.*	@ 15 00
LUMBER.—₱ M. *(Ordinary dimensions.)*				
Boards:				
Pine, 1st quality, clear	65 00 @ 75 00	50 00 @ 53 00	44 00 @ 49 00	
" 2d quality	55 00 @ 60 00	42 00 @ 44 00	40 00 @ 46 00	
" 3d quality	18 00 @ 22 00	35 00 @ 38 00	37 00 @ 44 00	
Spruce	@ 25 00	11 00 @ 12 50	*Not sold.*	
Hemlock	ea. 17 @ 18	12 00 @ 12 50	@ 10 00	11 50 @ 15 00
Yellow pine	20 @ 40	30 00 @ 33 00	@ 28 00	16 00 @ 18 50
Cypress	@	@ 35 00	@	@
Clapboards:				
Pine	@	33 00 @ 55 00	14 00 @ 22 00	—@—
Spruce	@	23 00 @ 30 00	*Not sold.*	—@—
Framing Timber:				
Pine			13 00 @ 15 50	25 00 @ 35 00
Spruce	14 00 @ 18 00	13 50 @ 14 50	*Not sold.*	18 50 @ 20 00
Hemlock	12 00 @ 15 00	@	13 00 @ 19 00	12 00 @ 13 00
Yellow pine	20 00 @ 30 00	21 00 @ 25 00		22 00 @ 24 00
Laths:				
Pine	@	2 00 @ 2 25	2 25 @	—@—
Spruce	2 15 @ 2 25	2 25 @ 2 50	*Not sold.*	2 40 @ 2 60
Shingles:				
Pine, shaved	5 00 @ 6 00	@	*Not sold.*	
Pine, sawed	4 00 @ 5 00	@ 4 50	2 25 @ 2 60	
Spruce, sawed	2 50 @ 2 75	@ 1 50	*Not sold.*	
Redwood	2 10 @	@ 3 00	5 50 @ 8 00	
Cedar, split	@	@	*Not sold.*	30" $10 @ 28 24" 8 @ 21
Cedar, sawed	@	2 00 @ 3 50	@ 2 30	20" 5 50 @ 14
Cypress. 7 x 24.	18 00 @ 20 00	5 50 @ 6 00	*Not sold.*	16 00 @ 20 00
Miscellaneous:				
Piles. ₱ ft.	4½ @ 6	Piles 6c. ₱ ft.	*Not sold.*	
Fence pickets, Spruce	8 00 @ 10 00	10 00 @ 18 00	Pine, 8 @ 22	12 00 @ 14 00
Cedar posts, 9 ft. (sq. posts.)	@	25 @ 35	9 00 @ 21 00	70 @ 1 25
Chestnut "	@	25 @ 35	*Not sold.*	28 @ 36
Finishing Woods: ₱ M. *First Quality, Kiln-dried.)*				
Ash	@ 55 00	38 00 @ 48 00	35 00 @ 40 00	
Cherry	80 00 @120 00	60 00 @ 90 00	75 00 @ 85 00	55 00 @ 65 00
Chestnut	@ 55 00	38 00 @ 50 00	45 00 @ 50 00	60 00 @ 80 00
Butternut	40 00 @ 60 00	60 00 @ 70 00	45 00 @ 60 00	55 00 @ 65 00
Mahogany, Baywood	@180 00	100 00 @ 150 00	150 00 @ 180 00	100 00 @
" St. Domingo	@350 00	180 00 @ 250 00	250 00 @ 300 00	
Maple	45 00 @ 50 00	45 00 @ 65 00	30 00 @ 35 00	30 00 @ 50 00
Oak, red	@ 70 00	@ 50 00	35 00 @ 40 00	35 00 @ 45 00
" white	@ 70 00	@ 55 00	35 00 @ 40 00	55 00 @ 65 00
" quartered	@ 90 00	65 00 @ 70 00	50 00 @ 55 00	70 00 @ 80 00
Sycamore quartered		@ 65 00		
Pine, clear	65 00 @ 70 00	60 00 @ 65 00	45 00 @ 50 00	85 00 @ 90 00
Redwood	70 00 @ 75 00	60 00 @ 70 00	60 00 @ 70 00	100 00 @
Rosewood. ₱ lb	@ 6		@ 7	
Walnut, black	125 00 @150 00	85 00 @ 100 00	80 00 @ 120 00	160 00 @200 00
Whitewood	45 00 @ 50 00	38 00 @ 45 00	30 00 @ 35 00	20 00 @ 30 00
Yellow pine. ₱ M	@ 45 00	40 00 @ 45 00	30 00 @ 35 00	30 00 @ 35 00
Gumwood, best red			30 00 @ 35 00	
PAINTS. *(In oil, ₱ lb.)*				
White lead, Am.	6½ @ 6¾	5¾ @ 6¼	6¼ @ 6½	4 @ 6½
" Zinc, "	5 @ 8½	8 @ 12	7 @ 11	4 @ 8
Red, Am.,	6 @ 6¾	@ 12	*Not sold.*	
" Venetian	6 @ 10½	7 @ 12	1¾ @ 2¼	4 @ 6½
" Vermilion	55 @ 60	55 @ 60 dry	50 @ 75	Am. 12 @ 16
Red Indian, Eng.	12 @ 20	14 @ 20	12 @ 20	12 @ 16
Yellow Ochre	6 @ 15	7 @ 12	3 @ 15	4 @ 9
" Chrome	12 @ 20	18 @ 25	12 @ 25	12 @ 25
Green (chrome)	8 @ 13	12 @ 20	8 @ 20	9 @ 14
Green, Paris,	16 @ 20	25 @ 40	16 @ 35	14 @ 29
Black, lamp,	8 @ 12	15 @ 25	8 @ 30	12 @ 18
Blue, ultramarine	12 @ 18	18 @ 30	10 @ 35	20 @ 35
Oil, linseed, (raw) (₱ gal.)	56 @ 57	54 @ 59	57 @ 60	54 @ 58
" " boiled	59 @ 60	57 @ 62	60 @ 62	57 @ 60
Turpentine	30 @ 32	37 @ 44	35 @ 38	38 @ 41
Varnish, coach	@	1 50 @ 6 00	1 25 @ 2 00	1 40 @4 00
Shellac	@	2 50 @ 3 00	3 25 @ 4 00	1 75 @3 00
Putty (₱ lb.)	2 @ 3	2 @ 4	02 @ 03	2 @ 2½
Whiting (Dry.)	50 @ 90	1 @ 1½	1 @ 2	¼ @ 7-10
Paris white, (Eng.,)	30 @ 2 00	2 @ 3	2 @ 2½	1 30 @ 1 60
Litharge, Am	5½ @ 5½	6½ @ 7	6½ @ 10	6½ @ 7
Sienna, (burnt)	12 @ 17½	14 @ 20	4 @ 16	9 @ 14
Umber, "	11 @ 16½	14 @ 20	@ 10	9 @ 14

(Continued on page vii.)

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AMERICAN, ENGLISH and FRENCH TILE.

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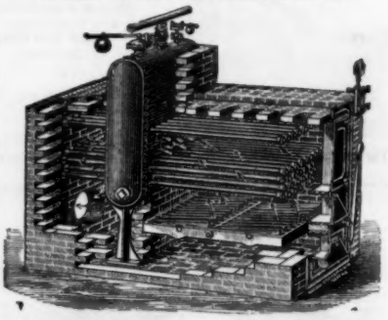
THE HOLLAND

Patent Wrought-Iron Boiler

FOR STEAM HEATING.



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COLD'S

Electric Warm Air Wrought-Iron Heaters.
Sectional Boilers.

Steam Compound-Coil Wrought-Iron Circulating Heaters.
Pin Radiators.

Combined Water and Steam Wrought-Iron Heaters, heated by live or Exhaust Steam for Cars, Factories, Shops, Conservatories, Public and Private Buildings, etc.

Saving in fuel fifty per cent over any other system.
Plans, specifications, & estimates furnished on application.

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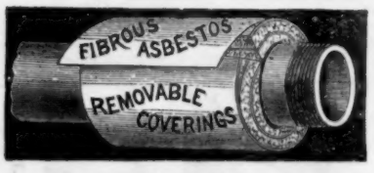

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Steam Heating Apparatus,

For Public or Private Buildings.

Sole New York Depot For the Sale of the

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Heating and Ventilation.

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MANUFACTURERS OF
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The most economical in use. Over 50 different kinds. Suitable for Families, Hotels, Restaurants and Public Institutions. Laundry, Hatters' and Tailors' Heaters. Hot-Plates, Warming-Closets for Pantries. Hot-Water Generators, etc., etc.

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FURNACES,
For burning Coal-dust, Sawdust, &c., will save from 50 to 90 per cent in your Fuel Account.
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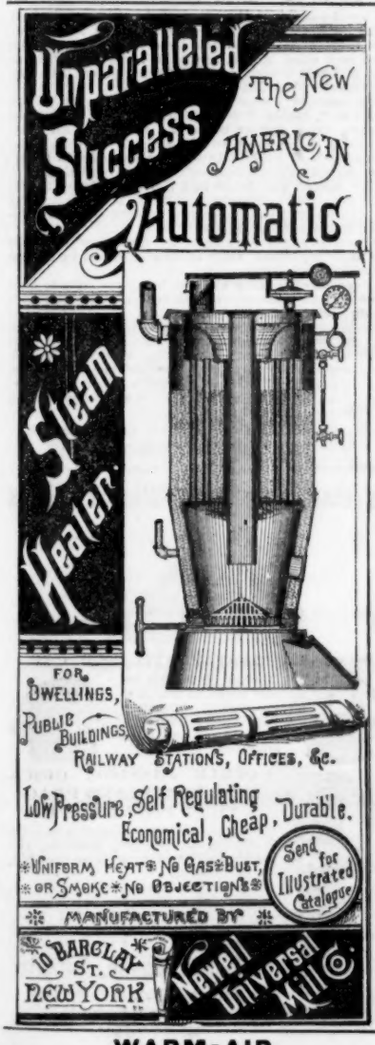
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The New American Automatic
Steam Heater.
FOR DWELLINGS, PUBLIC BUILDINGS, RAILWAY STATIONS, OFFICES, &c.
Low Pressure, Self Regulating, Economical, Cheap, Durable.
UNIFORM HEAT NO GAS NO DUST, OR SMOKE NO OBJECTIONS
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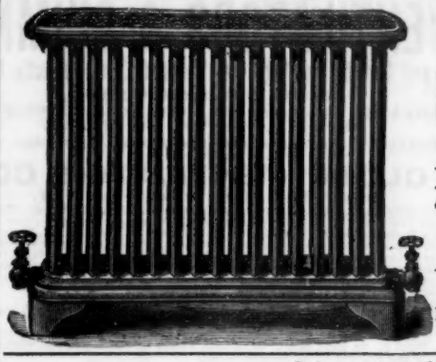

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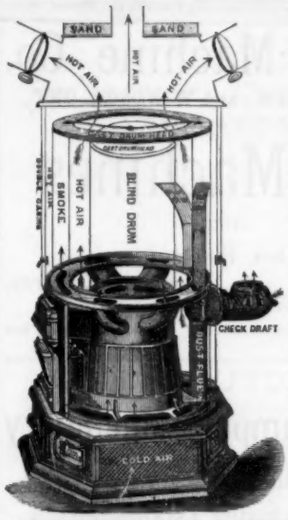

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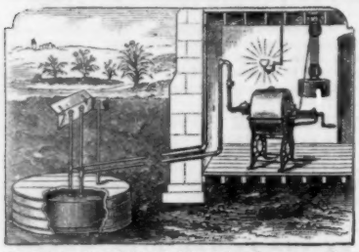

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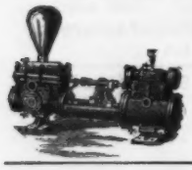

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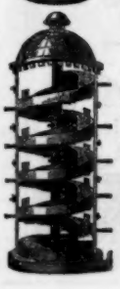

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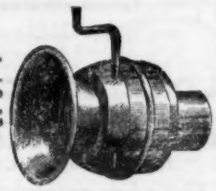

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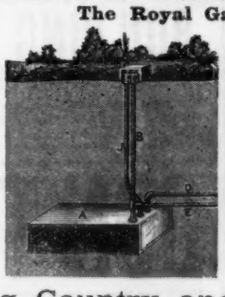

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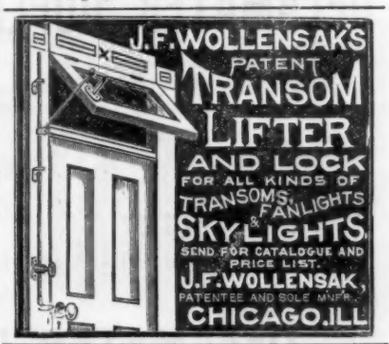

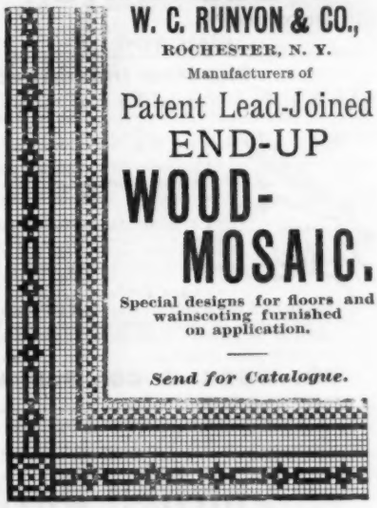

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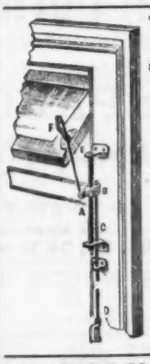

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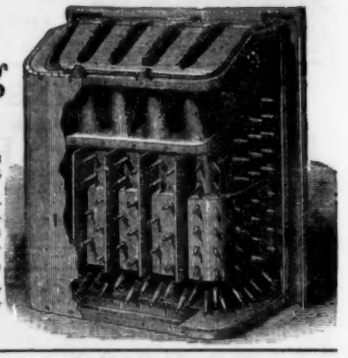

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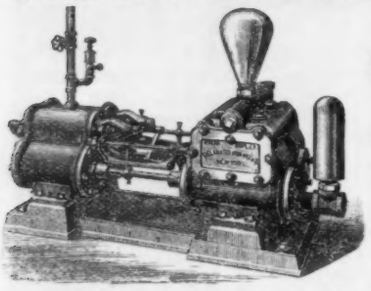

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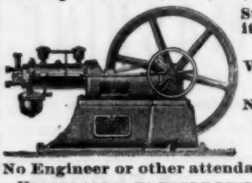

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THE AMERICAN ARCHITECT AND BUILDING NEWS.

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WE have received a letter, marked "not for publication," from one of the largest manufacturers of plumbing goods in New York, informing us that we know very little of the way in which such goods are sold, contradicting our statement that architects are not generally furnished with discount sheets by dealers, and complaining that our comments upon the dispute between the plumbers and the dealers in New York are "hardly fair to men who, it may be with considerable loss to themselves, stand up for what is just and right." In regard to the assertion made in the letter, that our information on the subject is very limited indeed, that the rule of our correspondents' house "has always been to furnish architects with trade discounts," and that the same thing "is done by all manufacturers of any standing" within his knowledge, we can only say, after such experience as can be gained from directing the execution of perhaps a hundred and fifty thousand dollars' worth of plumbing contracts, that we have never received but one discount sheet from the particular firm which objects to our conduct, and, if we recollect rightly, only one from any other manufacturer or dealer. Furthermore, on making personal request from our critics for a discount sheet to put with a new price-list that they had sent us, we failed to obtain it, and were obliged to seek the aid of a friendly plumber to secure a document which is unfortunately indispensable in examining plumbing accounts. If, by some strange oversight, our names alone have of late years been omitted from the mailing lists for discount slips of all the manufacturers and dealers in plumbing goods, we should be glad to know it, and to have them reinstated without delay, and if there are any other architects who do not receive discount sheets regularly, we shall be happy to have them join us in the application.

IN regard to the other question, whether the dealers are, in their struggle with the plumbers, standing up for what is just and right, against trade-unionism or communism, we confess to a certain doubt. Hitherto the matter of plumbers' trade discounts has presented itself to us only as a system under which, for some incomprehensible reason, architects were compelled, in examining plumbers' bills, to get out two or three printed price-lists, and find the value there set down as corresponding with each item in the account; then, with the help of such discount sheets as they could procure, to calculate the sum which must be subtracted from this price to find the net cost, and finally to add to the net cost a reasonable allowance for profit, say twenty-five per cent, and compare the result with the figures in the bill. As the discounts now vary from nothing to sixty per cent, according to the character of the goods, and have been seventy per cent or more for certain kinds, the conscientious performance of this duty involves an expenditure of time and labor on the part of the architect entirely out of proportion to that required for checking bills for other building materials. If, as we are told, the convenience of the dealers in plumbing goods is, in some mysterious way, promoted by requiring all this work of architects, we presume that those of the latter who are regularly furnished with discount sheets will submit quietly for the present, but the whole profession will welcome the day when wholesale prices of iron pipe and brass faucets are quoted like those of brick and wood, and can be as easily checked, with the usual profit added, on plumbers' bills. As we understand it, the plumbers themselves have something the same idea. Although we have been told the contrary in some of the dealers' letters, we do not find that the plumbers wish to conceal the trade prices of the goods they buy from those who wish to know them. Their principal claim is, not that the dealers should keep the trade prices secret, but that they should not sell at these prices to persons out of the trade, and, as we have said before, we see no reason why this favor should not be accorded to them, just as it is by wholesale dealers in other sorts of goods to their principal customers. If there are any reasons why the trade in plumbing goods should be made an exception to the rule, they can best be argued by the parties concerned, without reference to the architects, who would rejoice sincerely to see a definite retail price-list established for such goods, at a reasonable advance on the net cost, and all plumbers secured in the enjoyment of the profit to be derived from selling in accordance with it.

WE have a very pleasant letter from Cincinnati, setting us right with regard to the story about the "ruins" at the Art Museum, which we borrowed, with some suspicion, from the New York *Times*. The facts of the case are, in respect to the first structure spoken of, that six Corinthian columns, designed by the present architect of the Museum building, were saved almost uninjured from the fire which destroyed the County Court House last year. Although executed more than thirty years ago, the columns were designed with scrupulous fidelity to the best examples of the order, and as they would otherwise have been broken up to build cellar walls of, the suggestion was made that they should be preserved as models for the School of Design. Their value for this purpose is increased by the fact that there is only one other building in Cincinnati with Corinthian columns, and this is soon to be removed, and private individuals having offered to defray the cost of removing and setting up the columns, the Trustees of the Museum set apart a place for them, near the Museum, but necessarily outside, since the columns are forty feet high. We are very glad to make this correction, which shows the foundation of the *Times*' foolish story to have been a movement which does great credit to the thoughtfulness of those who suggested it. The other story, about the "Castle of Elsinore," appears to have had even less ground. It seems that a stone building was recently erected, but not near the Art Museum, by the City Water Works Board, to cover the valves in some large main pipes, and the superintendent of the works, or some other individual, thought fit to call the structure "Elsinore," and from this meagre material the *Times* reporter manufactured his romance about the Trustees of the Art Museum and their "model castle." We can only say that we are sorry to have been deceived by it, and shall wait, on the next occasion, for more evidence before we allow our faith in the good taste of those who direct the affairs of art in Cincinnati to be shaken.

A SERIOUS accident took place not long ago at Detroit, where the trusses of a new skating-rink fell in, carrying with it eight men who were at work on the roof. Fortunately, none of the men were fatally injured, although most of them received sprains or bruises. The building was constructed with walls of boards on light studding, carrying trusses one hundred feet in span. The description given in the Detroit papers is not very clear, but the trusses seem to have been of arched form, rising about twelve feet in the middle, with horizontal tie-beams. These tie-beams were made of three planks, bolted together, but carelessly constructed, one of them, as it lay on the ground after the accident, showing two heading joints between the planks at the same point, throwing the whole tension upon the third plank. The accident seems to have brought a great deal of unfavorable criticism upon the architect, who very injudiciously tried to excuse himself by saying that there was hardly an architect in the city who considered himself competent to design a truss roof of the character of the one which fell. This excited the indignation of his professional brethren, and they made haste to hold him up to still further scorn, which, whether deserved or not, will, we hope, teach him the lesson that detraction from the merit of others is a poor way to gain credit for one's self. The real responsibility of the architect for the accident seems to have been quite remote. Knowing his own inability to design such a roof correctly, he was prudent enough to employ a civil engineer to do it for him, including in

the commission the planning of the supports. This is exactly what he ought to have done, and what every architect should do in cases where he has reason to distrust his own imperfect or half-forgotten science, and upon the actual designer of the structure should rest the blame of its failure.

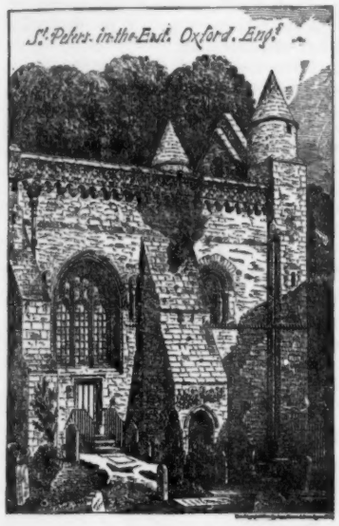
THE *Scientific American* makes a suggestion as to the cause of the frequent burning of barns which deserves the attention of architects. As an illustration of its theory it relates a story of a workman who, while helping to get in some hay which had been gathered in cocks and protected with caps the night before, remarked that the hay was warm. Another man suggested that it might be hot enough to light a match, and the first, to satisfy himself, dropped an unlighted match into a rick near by. In five minutes the rick was in a blaze. If hay stacked in an open meadow will set fire to a match, the *Scientific American* thinks that when packed in masses in a close loft it may heat so much as to kindle the more combustible particles, and burn itself, with the building containing it. Any one can satisfy himself of the effect of fermentation in raising the temperature of leaves or other vegetable substances by looking at a thermometer plunged in a fresh hot-bed, or by thrusting his hand into a heap of moist leaves, or fresh-cut grass, or even tan bark. In the former case he will often see the mercury far above one hundred degrees Fahrenheit, while the hand will sometimes detect a heat in the interior of the mass which it cannot bear without some discomfort. The larger the mass, and the more closely it is packed, the higher will be the heat, and where the air is prevented from circulating, the constant addition of heat may bring it to the point of charring the woody particles. Once at this stage, the sudden admission of air would probably set the charred material into a blaze. The best way of avoiding this danger is to provide thorough ventilation for hay-lofts. With free access of air, not only is the fermentation of the imperfectly cured hay checked, and a part of it thus saved from spoiling, but the heat is carried away before it becomes intense enough to do harm.

LE GENIE CIVIL gives some curious particulars in regard to epidemic cholera, which, if not very pleasant to read, may be useful to remember. According to Dr. Hector George, the author of the article, the second and final stage of the disease is characterized by a change in the condition of the blood, which becomes thick, "like gooseberry jelly," and gradually ceases to circulate through the veins and arteries. During this stage, which sometimes continues for a day or two before death takes place, the patient has the appearance of a corpse. The skin is cold and blue, from the darkening of the unoxygenated blood in the small veins and arteries, the pulse ceases, partially or entirely, and the lungs act so feebly that there is often difficulty in ascertaining whether vitality has wholly departed or not. In two instances, during the epidemic of 1848–49, cholera patients who had been pronounced dead were brought back to life; in one case by prolonged immersion in a warm bath, and in the other by injecting water into the veins; and it is singular that not only does the body usually remain without signs of decomposition for a long time, often five or six days after the action of the heart has stopped, but it is common, in the autopsy of victims of cholera, to observe movements of the limbs of the corpse. One surgeon mentions that in post-mortem examinations of cholera patients he had been obliged to fasten them to the operating-table, to prevent them from falling from it; and another speaks of a case where, having moved aside the hands, which interfered with his work, the corpse immediately replaced them in their former position. In the same case, the first touch of the scalpel, after the hands had been again removed and secured where they would be out of the way, caused a general muscular contraction; but, as the surgeon says, being accustomed to the movements of dead cholera patients, he went on and finished the operation which he intended. In view of these facts, it seems well to consider that in the terror of an epidemic, interments of those supposed to be dead are very likely to be hastily made, and if there is any reason to doubt the complete extinction of life, it is not only safe, but prudent, to delay final disposition of the corpse until all efforts at resuscitation have failed. Among the means for combating the deadly stagnation of the "collapse," Dr. George mentions particularly the use of water. Rubbing with hot, dry towels, blisters and massage have all been tried for restoring warmth and circulation, with more or less success, but together with these it seems necessary to restore fluidity to the blood, either by injecting water directly into the circulation, or by pouring liquids into the stomach through a tube. By the injection into the veins of a weak solution of salt in immense quantities, ten quarts or more in twelve hours, several patients have been saved; and twenty quarts or more of very weak broth in twenty-four hours have been absorbed through the stomach into the circulation, with the same effect.

THE same excellent journal reproduces a lecture delivered in August last by M. Chamberland, the director of the laboratory of M. Pasteur, upon the contagions in the air and in water, which, as giving the results of the most recent and scientific investigations of the subject is of great interest. According to M. Chamberland, the living organisms with which the carbuncle of sheep, the cholera of fowls, and the pulmonary consumption, measles, and gangrene of man are known to be connected may be divided into two classes, both of which live and increase in the blood, causing dangerous fermentations and decompositions, although they differ in form, as well as in certain important details of their life-history. One of these classes include the bacilli, all of which have the form of short hairs or rods, while the other comprehend the micrococci, or small, globular or oval bodies, often joined together, in different species, by twos or threes, or in greater number. When fully grown, both species have a soft, jelly-like appearance, and generally a uniform color, and may be observed to increase by budding or division, in one case a branch growing from the original body, which afterwards separates and becomes an independent organism, and in the other case the original creature dividing into short pieces, each of which takes up a separate existence. Besides this mode of increase, however, certain varieties of ferments have another, which consists, so far as can be observed, in the resolution of each individual into a considerable number of tiny eggs or spores. How these spores or germs reproduce the original organism is not shown, but it is remarkable that, just as the seeds of plants are far more enduring than the plants from which they are derived, and which they reproduce, so the germs of microbes resist adverse influences which immediately destroy the bodies from which they spring. Thus, while all bacteria are destroyed by a temperature one hundred and forty-eight degrees Fahrenheit, the spores of certain species bear without injury a temperature of one hundred and ninety-four degrees. Alcohol, carbonic acid, compressed oxygen, a long-continued vacuum, and most other antiseptic agents, which are fatal to fully-grown infusoria, have no injurious effect upon their germs, and the latter may be dried, and float indefinitely in the air, or may be buried for years in the ground, without losing their vitality, while the former would immediately perish under such conditions. It is perhaps fortunate that most of the micrococci, and many of the bacteria, produce, so far as is known, no spores, and among those which perpetuate themselves in that way the formation of spores takes place only under certain conditions. For example, in the blood of dead animals, which is no longer aerated by the action of the heart and lungs, bacteria live, but never produce germs, while the same effect follows if disinfectants are added to the liquid in which they exist, or if the temperature of the air in which an infected animal lives is kept below fifty-four degrees Fahrenheit, or above one hundred and eight degrees. Under circumstances unfavorable to the development of germs, the bacteria, with the offspring which they produce by division, live only for a limited time, and if no new infection takes place during that time, the ferment dies out, and with it the disease which it produces. As an illustration of this it has been shown that if a flock of sheep is attacked with carbuncle in winter, and is kept free from additional infection for thirty or forty days in a temperature below fifty-four degrees, the disease disappears, and does not return except as a consequence of fresh contagion from outside.

THOUGH crushed under "the thousand and one bricks on top of him" the "Rip Van Winkle" of the *American Architect* still has life enough left to affirm his belief that the quondam subscriber, who years ago complained because the journal contained no "funny column," will find in "Circular No. 5," of the Des Moines Architectural Association's Series (published on another page) quite as much that is humorous, if not witty, as can be well crowded into the same space. Being, however, thus annihilated, he feels a relief that he will no longer have to find printer and circulation for the dissemination of words and phrases the real meaning of which he shamefacedly confesses he has never been able to decipher.

THE FOUNDATIONS OF THE NEW CAPITOL AT ALBANY.[1]



THE author has not met with sufficient information to establish a rule for determining the load which may be safely imposed by a structure upon earth of a specific character and condition. The degrees of consistency and compactness in different kinds of earth and their mixtures, and, above all, the extent of moisture therein, so affect the supporting power as to discourage any attempt at a formula for practical use. The nearly universal rule seems to be, to depend upon the previous experience of the locality, or upon observations of structures supported on similar earths in like conditions; in fact, to guess at, what the author believes may, in most cases, be determined with considerable precision, and so avoid on the one hand the unnecessarily costly foundations which are so frequently observed, and, on the other hand, those inappropriate and insufficient foundations which cause the destruction of the superstructure.

He was requested ten years ago, to devise plans for the foundations of a large and costly State building, which had to rest upon soil apparently equable and stable; but which proved on careful examination, to lack these qualities to a remarkable extent. It was also found that the earth, to a great depth under many portions of the foundations, received and parted with a considerable amount of moisture with the changing seasons. The circumstances of the case did not allow the use of piles or inverted arches; it was, therefore, necessary to spread the base of the walls over such an area as would afford the requisite sustaining power, and also to protect the clay and sand from any excess or deprivation of its natural degree of moisture, so as at all times to derive from it the same degree of support. The importance of the work warranted the expense of experiments to determine the questions above referred to. In the absence of any similar or equally extensive experiments, the author is induced to submit the present ones, in the hope that an explanation of the methods adopted, and the results obtained, will prove serviceable.

The structure, though a single building, may be considered as a collection of a dozen large ones, with great differences of elevations, and weights upon the lower walls, and yet so bonded together as to require that the pressure of each of the parts should be the same per square foot on the earth beneath. This object has been fully accomplished; and when the structure is loaded to the maximum extent of 200,000 American tons, the author believes that it will not compress the earth upon which it rest more than three-fourths of an inch, and exactly the same under every part thereof. The building measures 300′ x 400′, on plan, and has three main stories and a basement. The lower walls are 110 feet high, but those of the corner towers, pavilions, and main tower, are of much greater height.

The ground covered by the structure sloped eastward at the rate of 1 in 25. The pit was excavated to a depth of 5 feet below the natural surface at the south-east corner, and 25 feet at the north-west corner. The excavations, together with the borings which were made in the bottom of the pit, fully exhibited the character of the earth. The lower strata (termed in the locality "blue clay," and "Albany clay") are more than 100 feet in thickness, resting upon the Hudson River Argillite (a clay slate), the two forming the banks of the river for thirty miles of its course. The "blue clay" contains from 60 to 90 per cent of alumina, the remainder is fine silicious sand. It also contains many nodules of clay, highly charged with carbonate of lime in the form of rings and discs about an inch in diameter. Overlying the blue clay was a mass of earth from 1 foot to 35 feet deep, composed of the same clay mixed with sand of different degrees of fineness, in proportions varying to such an extent as, when saturated, to render it in some places, a semi-fluid, while in others it was nearly pure sand, and very porous. This material occurred in veins and strata, large and small, above and below the level fixed for the foundation. One of the largest of these veins of viscid earth passed diagonally across the foundation, and at a depth of 6 to 20 feet below the bottom of the pit. It was 200 feet long, and from 5 to 25 feet wide.[2] Other veins and strata of less size were found extending across the bottom, and sometimes terminating in pockets in the blue clay. Borings, from 10 to 30 feet deep, were made in several places below the bottom of the pit, which showed the substratum to be blue clay; and a well which had been sunk close by, to a depth of 100 feet, was entirely in the blue clay.

The earth in its natural condition at midsummer contained from 27 to 43 per cent of moisture. When the samples were thoroughly dried and pulverized, and again fully saturated (without dripping), they absorbed from 39 to 46 per cent of water. The blue clay ordinarily held about 40 per cent, and when dried, again absorbed about 43 per cent. It was, therefore, as a rule, completely saturated in its natural state. It was upon this kind of earth that the subsequent experiments of the supporting power of the clay were made. The pure clay, obtained by separating it from the sand, weighed 116 lbs., and the sand so separated 80 lbs. per cubic foot; but when they were again mixed in different proportions the weight of the mixture was less than the proportionate means between them. Earth taken from the same places as the samples, varied from 81.5 to 101.4 lbs. per cubic foot, depending upon the proportions of the clay and sand; and these weights show, to some extent, the relative supporting power of the earth at the places from which the samples were taken.

It was originally intended to support the structure upon wooden piles, of which a considerable number had been procured, before the author was entrusted with the direction of the work. Many comparatively large buildings in Albany have been supported upon wooden piles driven into the blue clay, or upon thick planks laid under the walls. In a few cases, the wood used for this purpose has been found in tolerable preservation[3] half a century after it had been buried in the blue clay; but, generally, such timber was much decayed at the end of a quarter of a century; and several heavy buildings, after having stood firm for twenty years began to settle, and the walls to crack, in consequence of the decay of the wooden supports, and the unequal settlements therefrom. It appears that when the clay had been kept constantly moist, the wood did not materially decay in half a century; but, wherever the moisture was drawn off, the wood did not last more than twelve years. In this case, even if a wooden foundation could have been arranged so as to be kept constantly wet, it would have ultimately decayed; and its use was, therefore, inadmissible. Cast-iron piles of white iron could be relied upon for a century or more, but would also have eventually decayed.

The use of sand and concrete piles, made by boring or driving holes into the clay, and filling them with these materials was also considered. For reasons which will subsequently appear, inverted arches could only be used under a part of the structure,[4] and it was deemed advisable to have but one system of support. The author, therefore, finally determined upon the plan which has been executed.

In most buildings, except where spires or towers are introduced, the weight is nearly equably imposed upon the several foundation walls; but in the Capitol, the main and pavilion towers are much higher and heavier than the adjacent walls. The extremely heavy fire-proof floors, loaded as they will be frequently with dense crowds of people, books, etc., must necessarily carry their load to two only of the four surrounding walls, and, with some of the roofs acting in the same manner, will produce very unequal pressures upon the foundations.

The weight of the whole building and its contents when in use will be 200,000 American tons. The area of the base of the exterior and court walls, and the rear walls opposite, is about 24,000 square feet, and sustains an average of 6½ tons per square foot on the basement walls. The main tower, which weighs 30,000 tons, has an area of 2,508 square feet, equal to 12 tons per square foot upon its foundation walls. The weight on the foundation under the exterior walls of the corner towers is 47 tons per lineal foot; on the interior walls of the same towers, it is only 39 tons; and on the adjacent division walls, 23½ tons. Still greater differences in the weight on adjacent walls occur in other parts of the building, especially at the main tower, where the weight is 134 tons per lineal foot, and on the adjacent walls but 47 tons and 39 tons. Passing around the exterior walls of one-quarter of the structure (the remainder being a repetition of the same sized walls), the weights to be supported per lineal foot are successively as follows: commencing at the main tower, 134 tons (which may possibly be increased); the adjacent walls are 47 tons per lineal foot for 60 feet; next, 44½ tons for 60 feet; next, 47 tons for 120 feet (turning the corner tower); next, 44½ tons for 60 feet; next, 67 tons for 18 feet; and next, 50 tons for 52 feet to the centre of the south or north front. On the rear of each of these walls, the interior wall is loaded with 39 tons, and the division walls with 8½ to 23½ tons per lineal foot.

The exterior walls of cut granite facing, backed with rubble and brick, average 150 lbs. per cubic foot. The floors, including the iron box girders, cross beams, brick arches and covering, average 24 lbs. per square foot. The possible weight of crowds of people upon the floors is taken at 100 lbs. per square foot; the snow upon the roofs, at 2 feet depth, is 12½ lbs.; and the effect of the strongest winds, which may at times be deflected perpendicularly against some of the roofs, is taken at 15 lbs. per square foot. The calculated weight

[1] A paper by William Jarvis McAlpine, M. Inst. C. E., from *Selected Papers* of the Institution of Civil Engineers.

[2] This vein was dug out, and replaced with clay and sand artificially mixed, moistened, and slightly rammed in layers, so as to render it as similar to the adjacent natural material as possible.

[3] In digging the trenches for the street pipes of the new waterworks at Albany the author had occasion to remove many of the old pine water-pipe logs, of which only the sap wood was decayed. They had been buried in the blue clay more than half a century.

[4] It was necessary to arrange to carry two-thirds of the weight upon the exterior, rear, and court walls, which are separated 120 feet on two of the fronts, and only 90 feet on the other two. Inverted arches spanning three very unequal spaces would have imposed unequal loads upon the clay beneath, and their use would have defeated the design of distributing exactly the same weight upon every part of the clay beneath the structure.

which may come upon each of the walls is as follows: on the corner towers and front foundation walls, 47 tons per lineal foot; on the main east and west front, 50 tons; on the curtains, 44½ tons; on the ventilating tower, 67 tons; on the division walls, extending upwards through four stories, 23½ tons; on the partition walls of two stories, 13½ tons, and of those which extend one story high, 8½ tons, per lineal foot. The main tower is designed to be of stone, except the portion immediately below the dome, which, from being so high from view, was proposed to be made of iron. If it should be of stone to the dome, that change, together with some others, would increase its weight to 36,000 tons, equal to 14.4 tons per square foot at the base. Its footing stones were spread to 110 feet square, and the concrete to 125 feet square, and 5 feet thickness. The weight on the clay, with 30,000 tons, is 1.92 ton per square foot; and with 36,000 tons, it would be 9.3 tons; but it was arranged for an underpinning, if necessary.

THE EXPERIMENTS.

For the purpose of ascertaining the sustaining power of the blue clay in its natural condition, two sets of experiments were made; in the first, by pressure upon a square foot, and in the second, upon a square yard of the surface. The machine used was a mast of timber 12 inches square, held perpendicularly by guys, with a cross frame for the weights. A hole was dug, 3 feet deep, in the bottom of the blue clay foundation, 18 inches square at the top, and 14 inches at the bottom. The foot of the machine was placed in this hole, and weights 2,754 lbs. to 23,784 lbs. were applied. Small stakes were driven into the ground, in radial lines from the centre of the hole, and the tops carefully driven to the same level; and by means of a straight-edge any change in the surface of the ground adjacent to the hole could readily be detected and measured.

Table I shows a continued settlement of the clay under the foot of the machine as the loads were added; but no change in the surface of the adjacent ground was observed until an hour after a weight of 11,844 lbs. had been applied, when an uplift of the surrounding earth was noted, in the form of a ring with an irregular rounded surface, the contents of which, above the previous surface, measured 0.09 cubic foot, which is equivalent to a displacement of 1.09 inch of clay in depth under the foot of the machine, or equal to one-fifth of the whole settlement which had then occurred.

Table I.

Observation.	Day.	Hour.	Duration.	Weights.		Settlement.		
				Each.	Total.	Each.	Total.	
			h'rs.	lbs.	lbs.	in.	in.	
1	Mon.	5 P.M.	—	2,754	2,754	0.288	0.288	The weight of machine.[1]
2	Tues.	9 A.M.	16	—	—	0.612	0.900	
—	"	9 "	—	2,820	5,574	—	—	1st stone added.
3	"	10 "	1	—	—	0.528	1.428	
—	"	10 "	—	6,260	11,834	—	—	2d. and 3d. stones added.
¼	"	11¼ "	1¼	—	—	4.752	6.180	Uplift noted.
—	"	11¼ "	—	3,250	15,084	—	—	4th stone added.
5	"	1 P.M.	¾	—	—	3.588	9.768	
6	"	1 "	½	—	—	1.728	11.496	
—	"	1 "	5min.	2,890	17,974	0.060	11.556	5th stone. Immediate settlement.
7	"	1½ "	½	—	—	3.288	14.844	
—	"	1½ "	—	2,980	20,954	—	—	6th stone added.
8	"	2 "	½	—	—	4.128	18.972	Uplift noted.
—	"	2 "	—	2,830	23,784	—	—	7th stone added.
9	"	2½ "	½	—	—	5.184	24.156	
10	"	3 "	½	—	—	2. 6	26.216	
11	"	4½ "	1½	—	—	1.300	27.516	
12	"	5 "	½	—	—	3.084	30.600	Uplift noted.
13	Wed.	5 A.M.	12	—	—	0.600	31.200	No settlement after 5, A.M.
14	"	8 "	3	—	—	—	31.200	

Observations 12 and 13 are not reliable.

[1] The first settlement, noted in observation 1, was due to the weight of the machine, and was not a compression, but only a levelling of the rough inequalities of the clay. The subsequent observation 2, of 0.612 inch, is the compression due to 2,754 lbs. This settlement occurred before 5, A.M.

When the weight had reached 20,954 lbs., and had rested for half an hour upon the clay, a further protrusion was noted. The form of the ring was the same as before, but with more irregularity of surface. The highest part of the protrusion was from 12 to 15 inches from the edge of the pit, where it averaged 0.3 inch high, and sloped off outwardly to an average of 4 feet from the centre of the hole. This uplifted earth measured 0.606 cubic foot, which is equivalent to a displacement of 7.272 inches. When a weight of 23,784 lbs., had been applied, and had rested three hours on the clay, the ring in the highest part averaged 0.5 inch high, in the same general form and extent as before noted. The amount of earth thus raised, was 1.01 cubic foot, equivalent to a displacement of 12.12 inches under the machine.

Before the lifting of the earth surrounding the machine could have taken place, the materials first displaced from under the machine were doubtless forced among the particles of the earth adjacent to the whole, and compressed that earth to some extent; and this operation was continued until the adjacent earth had become so compacted as to cause the lifts noted in the table. The author is of opinion that the compression of the earth below the bottom of the machine continued without any considerable displacement until after a load of 4,000 lbs., of 5,000 lbs. had been applied, and that then the displaced earth found space in the adjoining earth until the load reached 7,000 or 8,000 lbs., when the uplift became visible at the surface of the ground; but that meanwhile the earth directly under the machine was continually more and more compressed in some proportion to the weight added. The small area pressed upon facilitated the escape of the material into the adjacent earth, which weighed only 300 or 400 lbs. per square foot. If the pit had been deeper, or the piston larger, there would have been less displacement.

The second set of experiments was made with the same machine, to the bottom of which was framed a strong base, 3 feet square. The pit was sunk 2 feet deep into similar earth, and was 38 inches square both at the top and at the bottom. The stones were put on at intervals of an hour. There was no uplifting of the surrounding earth.

Table II shows the remarkable regularity in the settlement as the load was increased, and a constant diminution of the increment as the earth became more compacted. At the 6th observation the weight per square foot corresponded nearly with the 2d in Table I, and the settlement was almost the same. The base was nine times as large, so that the proportion of escapement of the earth from beneath, must at this time have been very small. It is probable, however, that if the weights per square foot had been increased so as to equal those in Table I, a similar uplift would have occurred, though of less extent. The author derived from the Tables the opinion that the extreme supporting power of this earth was less than 6 tons per square foot, and that the load which might be safely imposed upon the clay was two tons per square foot.

Table II.

Observation.	Weight.			Settlement.		
	Each.	Total.	Per sq. ft.	Each.	Tot'l.	
	lbs.	lbs.	lbs.	in.	in.	
Machine placed.....	3,228	3,228	359	—	—	No settlement that could be measured.
1st stone added.....	2,380	6,608	623	0.050	0.050	
2d " "	3,300	8,908	990	0.150	0.200	Estimated.
3d & 4th stones added	6,960	15,868	1,763	0.166	0.366	
5th " "	2,830	18,698	2,078	0.134	0.500	"
6th " "	3,250	21,948	2,439	0.124	0.624	
7th " "	4,420	26,368	2,929	0.096	0.720	"
8th " "	1,190	27,558	3,062	0.080	0.800	
9th " "	2,320	29,878	3,320	0.025	0.825	

The notations of the settlement were generally made about an hour after the weight had been applied.

For the purpose of maintaining the clay beneath the structure in the same condition of moisture, a deep puddle wall was extended entirely around the foundation, not only to exclude an excess of water, which might reach it through the veins and films of sand with considerable hydrostatic head, but also to prevent the egress of the natural moisture through similar veins. Although the puddle wall was carried up to the level of the terrace which surrounds the building, yet water might find its way along the face and down the outside of the walls, or possibly through some accidental break in the concrete floors within and surcharge the clay below. To prevent this, there was spread on the top of the clay, over the whole area enclosed, a depth of 6 inches of coarse screened gravel, the effect of which will be that under the great weight of the building any excess of water in the clay beneath will be forced into this pervious gravel, and flow off through it to the drains which encircle and traverse the foundations. The necessity for these provisions will be apparent when it is considered that many of the veins of sand extend to the surface of grounds of much greater elevation than the foundations, and that they communicate with imperfectly built street sewers and water-pipes, while the same or other porous veins extend beneath the surface to grounds which are much lower. Through these sources the clay under some portions of the structure might be charged with water, while that under an adjacent wall might, at the same time, be drained of much of its natural moisture, and thus entirely destroy the design of a foundation which should everywhere have an equal sustaining power. It is not an absolute settlement which is to be apprehended, but a greater yielding in one place than in another.

A common practice of builders who have occasion to erect high and comparatively heavy towers and spires, is to groove the lower part into the adjacent walls, so as to allow the heavier ones to slide in these grooves, without breaking the bonding stones. In the present case the demands of the architect forbade the use of grooving, and hence the necessity for the above provisions.

The main walls of the building are from 5 feet to 7 feet thick, where they rest upon the foundation walls, and bring upon them pressures of from 6 to 9 tons per square foot, which had to be reduced to 2 tons per square foot on the clay. This was accomplished by projecting each of the footing courses beyond those immediately above them. The rule was to commence with a load of two tons per square foot upon the clay, 3 tons upon the top of the concrete, and generally 4, 5, 6, or 7 tons upon each succeeding course of stone. The weight on each lineal foot of the top of the foundation walls, divided by the above pressures, gives the exact width of each course of the footing stones, as shown in Table III.

The large quantity of stone required in a short time — 50,000 tons in four months—compelled a resort to a great many quarries, which furnished stones of different thicknesses, and made it necessary to modify the above exact arrangement; but the principle of the distribution of the load, according to the vertical strength of the stone used was maintained throughout the foundations.

It was necessary to consider how far these projections could be

made without danger of breakage of the projecting part of the stone. The pressure in this case tending to break the stone is that due to the weight on the wall above it, divided by the width of the wall, and multiplied by the area of the projection, and to treat that result as a load distributed on a beam supported at one end.

To distribute the weight upon the footing stone courses with certainty, the beds of the limestone and granite were dressed to close

TABLE III.

Parts of Building.	Load per Lineal Foot.	Required width of Courses.						Main Walls.
		Concrete.	Courses of Footings.					
			1st.	2d.	3d.	4th.	5th.	
	tons.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.
Corner towers, front	47	23 6	15 8	11 9	9 4	7 10	7 4	7 0
" " rear	39	19 6	13 0	9 9	7 10	6 6	5 6	5 0
Curtains, front.....	44½	22 3	14 8	11 1	8 11	7 5	6 5	6 5
Central fronts.....	50	25 0	16 8	12 6	10 0	8 4	7 2	6 5
Partitions, 4 stories	23½	11 9	7 10	5 11	4 9	3 11	3 5	3 0
" 2 "	13½	6 9	4 6	3 5	3 0	—	—	3 0
" 1 "	8½	4 3	2 5	2 2	2 0	—	—	2 0

parallel joints, so that the weight of each of the upper courses should be carried out to the extremity of the next course below. The vertical joints were only required to be quarry joints, not exceeding one inch wide. For certainty and convenience of laying the masonry, the foundation stones were all required to be rectangular blocks, of from 18 to 24 inches in thickness, the breadth to be at least one-and-a-half time the thickness, and the length two-and-a-half times the thickness. The average size of all the stones was 31 cubic feet, equal to 2½ tons, and many of them were from 5 to 8 tons in weight. In the foundations of the main tower the average weight of the granite blocks was 4 tons, and of the projecting blocks 7 tons. The footing courses were spread out equidistant from the lines of the centre of gravity of the imposed weight above. The exterior stones of the three lower footing courses were all headers from 4½ to 7 feet in length. The longitudinal bonding was made by the interior stone and in the upper courses, where the projections were smaller, by alternate headers and stretchers of the front stone, as well as the interior. The result of this bonding will be to distribute the weight, and equalize its pressure upon the clay.

The weight of the main tower was so much greater than that of the other walls, and the earth below it so much inferior, that the foundation was placed 7 feet deeper than elsewhere. With this exception, all the walls were commenced at the same level. The spaces between the main exterior, rear and division walls, and under the arches of the central court, were covered with a layer of concrete, made of screened gravel and hydraulic cement, 1 foot to 2 feet thick.

A CONTEMPORANEOUS ACCOUNT OF ST. SOPHIA.

Capital from Santa Sophia.

DURING some investigations at the Astor Library, I chanced to encounter the following contemporaneous account of St. Sophia. It possesses especial interest from more than one point of view. The work from which it is taken is a French translation, by Cousin, of Procopius's original Greek MS. Procopius, the book tells us, was born at Cæsarea, 495 A. D., and died at Constantinople in the year 565. He was general naval commander, municipal officer, and man of letters, being in turn Lieutenant to Belisarius, Admiral of the Byzantine fleet, Prefect of the city, and author of a history of his own times, of a private history of the reign of Justinian, and of six books of descriptions of public buildings. It is from the last that the passage below is taken. Of all his works, the history of his own times seems to be the best known; it has been translated into all the modern languages, English included. The "*Descriptions of Public Buildings*" have never, so far as I can find out, been honored by an English version. The Congressional Library in Washington possesses a Greek and Latin copy, and the Astor Library a French and Italian rendering. The admirable choice of phrases with which a pendentive dome is described, amply justifies the sentence in Cousin's preface which says of Procopius: "*Il a écrit avec exactitude, avec politesse, et avec élégance.*"

"I have already related with sufficient exactness, in the books of the wars, how there existed at Constantinople a furious sedition, excited by a multitude of persons of low condition, who took 'conquer' for a watchword. They did not revolt less against God than against their prince, for they carried their impiety to such an extreme as to burn the celebrated church which we call the Church of St. Sophia, a term well suited to the Divinity, and which is very proper to explain His nature. God permitted them to commit their sacrilege, in the knowledge that this would afford an opportunity to rebuild the church with more magnificence than ever. Having, then, thus been ruined, it was soon after restored by the emperor, and enriched with such ornaments that if, before its ruin, the design on which it was to be rebuilt had been shown to the Christians, and it had been suggested to them to tear it down in order to rebuild it in this way, they would have consented with joy.

"The emperor applied himself to this work with inconceivable ardor, and imported from all parts the most excellent workmen of his time, regardless of expense. Anthemius of Tralles, who was the most able architect, not only of his own time but of all antiquity, seconded with all his ability the intentions of the emperor, in making the designs and in conducting the work. Isidorus of Miletus, also a celebrated architect, was also employed. In this you see the special favor of God towards Justinian, in that he furnished him with men capable of accomplishing successfully his glorious enterprise. We ought to admire at the same time the sagacity of this prince in choosing men proper for his wishes.

"It is thus that this marvellous church was accomplished and that it became a spectacle which surpasses the understanding of those who see it and the belief of those who hear it spoken of. It towers to a prodigious height commanding the whole city, so much so that it is everywhere the most conspicuous ornament. It rises so high above the other buildings that it seems to look down upon them. There is such a nice proportion between its length and breadth that neither seems extraordinary: neither the one nor the other seems extravagant. It is impossible justly to describe its beauty; it has such majesty and harmony in its parts that it is impossible to remark either an excess or a fault. Although its size surpasses that of all other works, its ornaments are more exquisite than those of many buildings of only moderate dimensions. It shines with such brilliancy and splendor that one would say that, besides being lit up by the rays of the sun, it held some source of light within itself. The front towards the east, where the ineffable mysteries are celebrated, does not rise squarely, but with the form of a half-cylinder. The top is not unlike a quarter-globe; it has above it a work like a half-moon. The art with which this is constructed excites fear, as well as admiration; for, solid as it is, it is suspended in such a way as to seem about to fall, and seems to imperil those who look at it. There are on the pavement within, two ranges of columns arranged in semi-circles, which sustain the base of the half-dome. Opposite the east is a wall in which the doors of the church are situated, and on two sides of which are two ranges of columns similar to those I am about to describe.

"In the centre are four great piers, two towards the south and two towards the north, which correspond to each other and all equally distant. On the two sides between the piers are four columns. These piers are made of large blocks carefully chosen and well polished and joined together; their height is such that one would say they were rocks detached from a mountain. Above, on the four sides, are four arches, each pier sustaining the base of two arches. The crown of each arch rises to an astonishing height. The two arches which are on the east and west are void and open; the other two are filled with a small structure of columns, above which is a round opening, high up through which you can see the light of day. I fear I may not have the capacity to explain myself, yet I hope I may find words to describe what follows in this wonderful work. Between the four arches are four triangles, each of which has an acute angle supported between the bases of the two arches, and raising their other two angles up to the base of the dome. The dome rests on these, a superb feature. Its delicacy compels one to doubt its solidity, and it seems, instead of resting on the work below, to be suspended from heaven by a golden chain. All the parts, joined together with such art, form a marvellous assemblage which one cannot behold without delight and surprise. The eyes cannot long remain in the contemplation of one place without being drawn away by the beauties of some others; the spectators are in a transport and continual agitation, doubting which most to admire. Their minds follow the movements of their eyes, and after being turned from side to side, they remain in a sort of suspense. But enough on this subject.

"Justinian, Anthemius and Isidorus employed divers means to strengthen this edifice. As I do not know all of them, it would be impossible for me to explain them, but I will describe one, which will suffice to enable the reader to judge of the others and understand the solidity of the building. The piers of which I have spoken are constructed differently from the rest of the church; they are square, and built of hard stones polished. The stones on the corners are hewn in the shape of a triangle, and those in the centre in the shape of a square; they are not joined either with lime or bitumen, like the walls of Semiramis, at Babylon, but with melted lead. So much for the piers; let us now look at the rest. The dome is resplendent with gold, and its richness is combined with beauty. The brilliancy of the marble vies with that of this rich metal. There are on each side two galleries, which, far from injuring the design, improve it, making the breadth of the church equal its length, though they are not so high as the rest; they are covered by gilded vaults. One is for the men and the other for the women. They are exactly alike and have no difference between them except in beauty. Who can begin to describe the magnificence of the women's gallery, and the aisles adorned with such rich and precious columns? Who could speak of all the marbles which serve to ornament this marvelous church? It seems as if one were in a meadow agreeably enamelled with all sorts of flowers, and that one saw there green, white, red, purple, and all the other colors which Nature has blended together with more skill than the most learned painter. When you enter there to pray, it seems more like a work of God's wisdom than of man's art; the soul which unites itself

to Him in prayer imagines Him present, and His Presence, which has chosen a place so august, seems to honor it by dwelling there. It is not only the first time you enter this church that this thought occurs to the mind; it presents itself each time anew. One is never tired of looking. Every one is overcome by the sight, and when you have come away you never cease to talk of it.

"It would be impossible to describe in detail all the ornaments, all the vases of gold and silver, and all the gems which the emperor has presented. I will leave you to judge of their number and price by a single example, which is that there are forty thousand pounds of silver in the enclosure for the altar. Here only the priests are allowed to enter.

"To finish this account and to conclude in a few words the description of so admirable a work. Justinian employed upon it not only the resources of his treasury, but also the efforts of his genius. While one of the arches of which I have already spoken, that on the east, was still unfinished, the piers on which it was supported began to settle and to threaten ruin. Anthemius and Isidorus, despairing of their skill, went to report this deplorable event to Justinian, who, by an inspiration from God, as I believe, for he had never practised architecture, commanded them to finish the arch, and assured them that when it was completed it would stand of itself with the help of the piers. I should be suspected of flattery if I advanced this anecdote without proof; but as many persons who were present can testify to the truth of what I say, I will continue. The architects followed this order, and when the arch was completed it remained firm, as the emperor had said. The same thing happened to the arches on the north and south sides. When the vaults were closed the whole base of the edifice began to groan, so to speak, under the weight of the burden. The columns which sustained it pushed out all the mortar as if they had been scraped. Reduced to despair, they went to tell the emperor what had happened. But he found the remedy at once; he commanded that the part of the piers immediately above the arch should be taken down, and he had it put back when the moisture was dry. Since then the work has always been perfectly solid and can serve as an illustrious witness of the industry and enterprise of this prince." Grenville Temple Snelling.

THE ILLUSTRATIONS.

THE ABBEY CHURCH OF ST. ETIENNE.[1]

THIS abbey, undertaken by the Duke William, is stated by Huet and authors in general to have been completed in 1064, two years prior to the conquest of England. According to Ordericus Vitalis, it was not dedicated till 1077. But upon this latter point authors are not agreed; some say that the dedication took place in 1073, and others in 1081. However this may be, it seems certain that the foundation-charter was granted subsequently to the year 1066; for in it William takes the title of king, and among his many princely donations are enumerated various properties and privileges in different parts of Britain. The monastic buildings appertaining to the abbey were begun in 1074, and completed after a period of twenty-two years. The plan of the buildings was furnished by a lay-brother of the Benedictine order, named William de la Trumblaye, who also erected those of the sister convent of the Trinity at Caen, and those of the abbey of St. Denis. The nave and transepts are the only unchanged remains of the original building; the choir and aisles are of pointed architecture, and are consequently not of the same antiquity. Even the western front partakes, in a measure, of the same mixture. All to the top of the towers is genuine Norman, and of the eleventh century; the spires, with their surmounting turrets, are of a later æra. The choir was enlarged and the apses built in the year 1316 to 1344. The western front of the church exhibits two different characters. Below all is simple almost to meanness; the upper part abounds in ornament, and here the good sense of the architect who added the pinnacles and spires merits commendation in having made them correspond so well in their decorations with the towers.

The plate sufficiently explains all that is to be said of this part of the building, excepting as to the more minute ornaments of the doorways, which deserve to be exhibited in detail. The archivolt is composed of several bands of the simplest moulding, inclosed within three of a different style; the two outermost being formed of the chevron ornament, with its angles unusually acute, the inner of the billet moulding. The capitals of the pillars are studded with small heads, placed under the Ionic volute, exhibiting a mixture of classical and barbarous taste, which is likewise to be found at Cérisy, and upon one of the capitals of the Abbey Church of the Trinity. Along the exterior of the upper part of the nave runs a row of twenty-four semi-circular arches, with imposts and bases, and all uniform, except that eight of them are pierced for windows. This portion of the building is entirely without buttresses; upon the extremity of the north transept are three very shallow buttresses, which rise from the ground to the bottom of the clerestory windows, unbroken by any interruption whatever, but here meet with a string course, beyond which the two outer ones are continued, unchanged in form and appearance, to the summit of the ends of the gable, while the centre one, though it is raised to an equal height, loses more than half its width, and is also much reduced in depth. Over this latter buttress is a window, and between the buttresses are six others, arranged in a double row; each pair differs in size from the rest; those nearest the ground are the largest, and those immediately above them the smallest; the lowest pair on each side is inclosed within a spacious arch, which occupies nearly two-thirds of the gable. Eastward of the transepts is a series of blank intersecting arches, remarkable for their mouldings, which consist of a flat, wide and very shallow band; and here the mixture of the pointed with the semi-circular architecture commences. This portion of the building altogether resembles the Cathedral of Coutances in the disposition of its parts.

It would be difficult to describe the interior of the church in clearer or more comprehensive terms than has been done by Mr. Cohen in Mr. Turner's tour, from which account the following extract is therefore extracted: —

"Without doubt, the architect was conversant with Roman buildings, though he has Normanized their features, and adapted the lines of the Basilica to a *barbaric* temple. The Coliseum furnished the elevation of the nave: semi-circular arches, surmounted by another tier of equal span, and springing at nearly an equal height from the basis of the supporting pillars. The architraves connecting the lower rows of pillars are distinctly enounced. The arches which rise from them have plain, bold mouldings. The piers between each arch are of considerable width. In the centre of each pier is a column which ascends, as usual, to the vault. These columns are alternately simple and compound. The latter are square pilasters, each fronted by a cylindrical column, which of course projects further into the nave than the simple columns, and thus the nave is divided into bays. This system is imitated in the Gothic cathedral at Sens. The square pilaster ceases at about four-fifths of its height; then two cylindrical pillars rise from it, so that from that point the column becomes clustered. Angular brackets, sculptured with knots, grotesque heads, and foliage, are affixed to the base of these derivative pillars. A bold, double-billeted moulding is continued below the clerestory, whose windows adapt themselves to the binary arrangement of the bays. A taller arch is flanked by a smaller one, on the right or the left side as its situation requires. These are supported by short, massy pillars; an embattled moulding runs round the windows In the choir the arches become pointed, but with Norman mouldings; the apsis is a reconstruction. In that portion of the choir which seems original, there are pointed windows, formed by the interlacing of circular arches; these light the gallery. The effect produced by the perspective of the interior is lofty and palatial. The ancient masonry of the exterior is worthy of notice. The stones are all small, perhaps not exceeding nine or twelve inches; the joints are about three-quarters of an inch."

To this description it may be well to add the following particulars concerning the dimensions of the church, taken from the exterior: —

	feet.
Length from east to west	371
Height of western towers	145
" " " with their spires	262
Nave on the western front, to the point of the gable	98
Northern transepts	84
Width of northern transepts	42½

DOORWAY OF CHURCH OF SAN PABLO, BARCELONA.

The churches of Barcelona are of great antiquity, the cathedral, which is still unfinished, dating in part to the earliest Christian times, while the church of St. Michael, now destroyed, is said to have been a temple of Neptune before its re-consecration to the new religion, and preserved until within a few years a curious ancient mosaic. As is natural in a city which, founded by the Cathaginians and throughout the Roman period an important seaport, the buildings, even of mediæval times, show plainly the influence upon their designers of the classical work which then existed all about them, and even now remains in numerous fragments about the city. In the plate which we give, the classical suggestions can be easily traced in the capitals and mouldings of the archivolt, although the treatment is thoroughly Romanesque, or perhaps we might better say, early Gothic; and a closer inspection will show also the effect of antique examples in the dignity and breadth of modelling of the sculptured figures.

BLOCK OF STORES FOR L. D. MORRIS, ESQ., GRAND RAPIDS, MICH. MR. SIDNEY J. OSGOOD, ARCHITECT, GRAND RAPIDS, MICH.

The cost of this building, including plumbing and steam-heating, is to be $25,000.

HOUSE AT MANCHESTER-BY-THE-SEA, MASS. MR. W. RALPH EMERSON, ARCHITECT, BOSTON, MASS.

Concrete Water-Mains. — Concrete water-mains of small diameter have been turned to account in the towns of Coulommiére and Aix-en-Provence. The pipes are made in the trench itself, by stamping in the concrete into sheet-iron moulds about two yards in length. Mortar serves to set the joints. Concrete man-holes are formed at intervals of a hundred yards, to facilitate the cleaning of the pipes. The ingredients of the concrete are three parts slow-setting cement, three parts river sand, and five parts limestone débris. The whole cost of the pipes, which answer the purpose of conduits very well where the pressure is not great, is said to be about ninety-three cents per running yard. — *Exchange.*

[1] From Cotman's "*Antiquities of Normandy.*"

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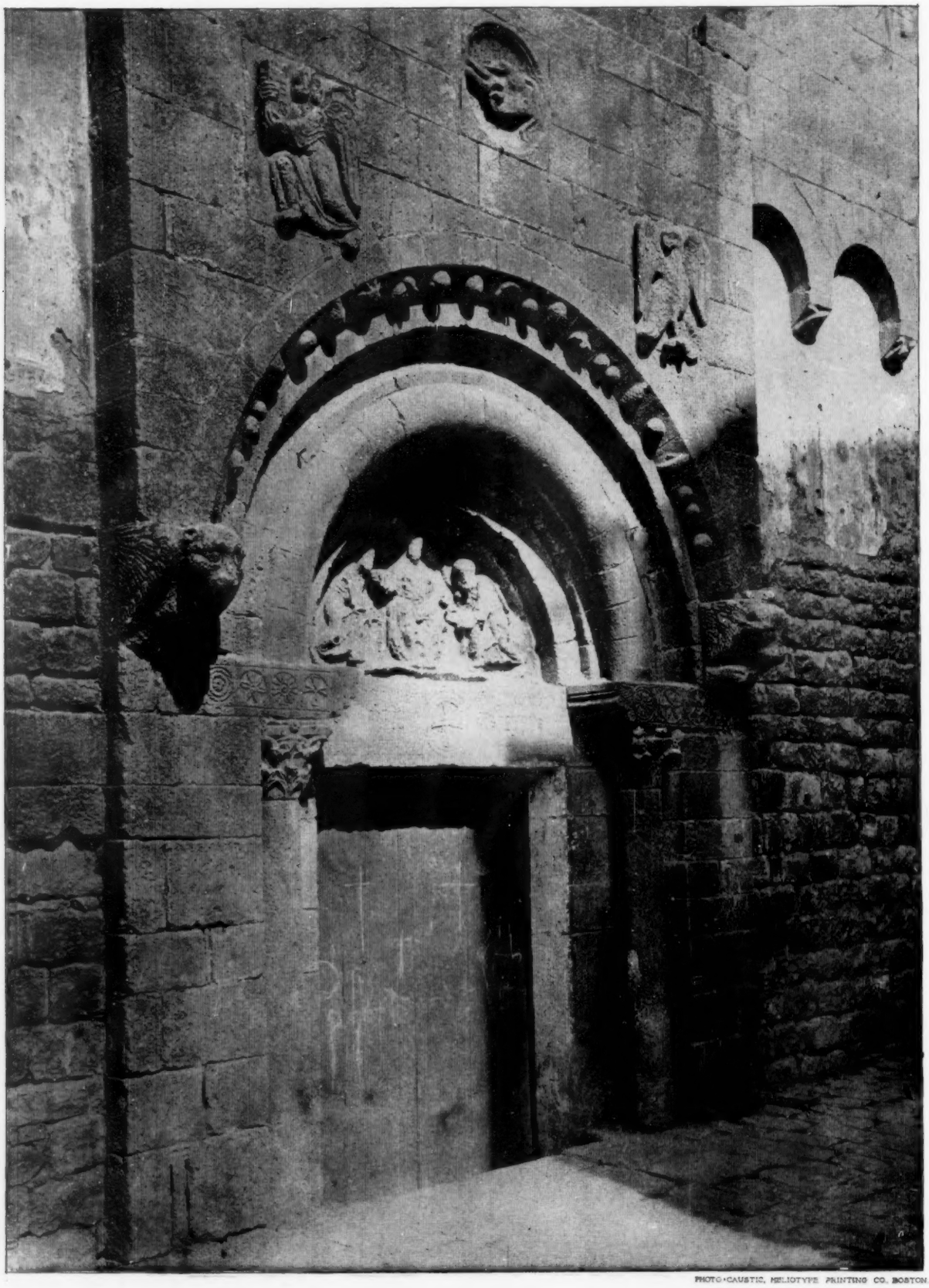

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Convent of St. Paul, Barcelona, Spain: Doorway of Cathedral.

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Pencil Sketches in & around Manchester, by the Sea, Mass.

by E. Eldon Deane.

House at Manchester —
Mr. W. R. Emerson Arch't —
E.E.D.

Mr. Hemenway's House
Mr. W. R. Emerson
Arch't.
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The Heliotype Printing Co. 211 Tremont St. Boston.

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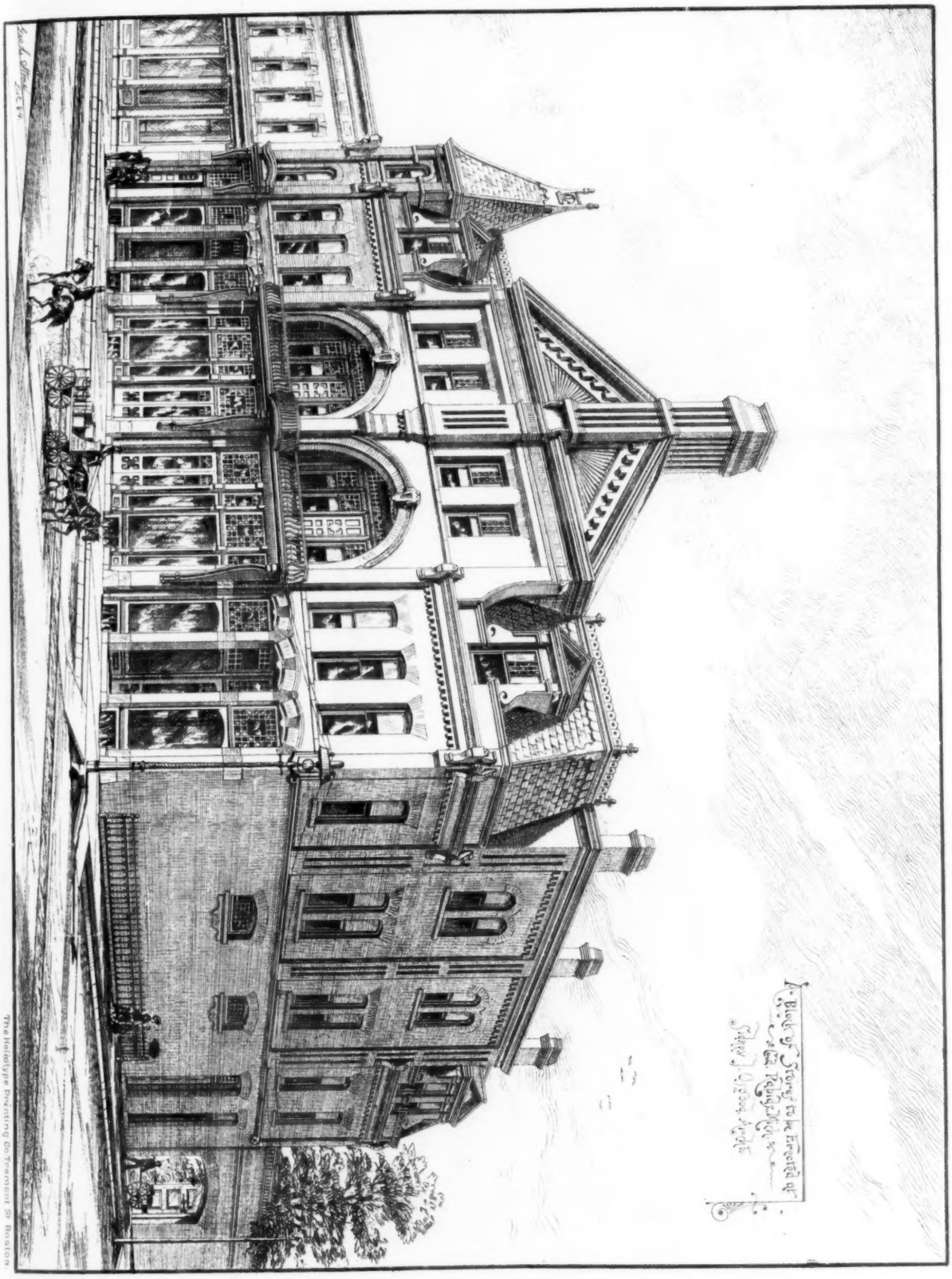

A Block of Stores to be Erected at [illegible]

[illegible] Architects

The Heliotype Printing Co. Tremont St. Boston

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ABBEY CHURCH OF ST ETIENNE, CAEN.

THE ROYAL ARMORY OF MADRID.

Heraldic Lion in Panel. Mont. S. Michel. France.

A FEW weeks since, says a correspondent of the *Times*, the news arrived of a fire having occurred on the roof of the Royal Museum of Arms and Armor at Madrid; news which startled every historian, archæologist, and lover of the fine arts to whom by hearsay or by sight that invaluable collection was known. Strangely enough, beyond the mere notice of the accident, scarcely any further information has been published in England on the subject, which, as far as the general reading public is concerned, has almost faded out of memory. Not so with those who know the priceless gems of that most rich museum, taking rank as it does with the armories of Vienna, Dresden, Turin and Paris.

In a long room on the first floor of an isolated portion of the ancient palace, and facing the court-yard of the new, these treasures had been gathered together, and were admirably mounted and arranged under the constant and untiring care of a true art lover, the Conde de Valencia de Don Juan. Here were grouped the numerous and remarkably fine suits of armor for the tournament, for war, or for mere pomp, which actually belonged to, and had been used by the Emperor Charles V, after whose death the other moiety of the Imperial armory passed to the Hapsburgs, and is now preserved at the Vienna Arsenal. Some twenty suits remain at Madrid, among which are some of the finest examples of the Flemish, the Italian, the German, and the Spanish armorer's art, variously enriched by inlay of silver and gold, by graving, and by incomparable *repoussé*. One of the helmets (which has been estimated by good authority as likely to realize at least 75,000 *frs.*, at the Rue Drouot or Christie's) and some shields are quite unrivalled for their admirable design and the perfection of their workmanship. Then in sequence were arranged the splendid suits and weapons which belonged to Philip II, to Don Carlos, to Philip III, and Philip IV, trophies of Lepanto, numberless historic swords, such as that of Francis I, of "el Gran Capitan," Fernando Cortez, Pizarro, etc., many of which are of surprising beauty. For years, after the Spanish fashion, these arms lay here and there neglected in various palaces, etc., exposed to the chances of rust, rough usage, or robbery, until of late, under the intelligent initiative, and at the private expense (some 250,000 *frs.*) of King Alfonso XII, and the painstaking assiduity of a true connoisseur, the collection was barely finished in arrangement when this disastrous fire has thrown all into a second chaos. The effect of that long room, filled with mounted warriors and wearers on foot of these rich suits, was very striking; but that general effect was soon forgotten in the examination of the lovely details of ornamentation which covered the surface of so many of the choicer arms. The "dummy" men and horses on which they were mounted, some portraying the features of those monarchs whose steel shells they bore, were richly caparisoned and decked in costly stuffs of the period of the armor, and copying, as far as could be, the costumes represented in painted portraits of their time; all had been directed by high intelligence. Such was this rich treasure-house when visited a short time since by the writer of this article. By great good fortune the manuscript illustrated catalogue made by order of Charles V existed, and was the foundation for recognition and classification of various important pieces. Contemporary portraits at the Prado and elsewhere also helped in the identification.

On July 10, some short time before midnight, the northern angle of the roof was seen to be on fire. There, in the very centre of the capital, within full view of the Palace Guard (for the building formed one side of the quadrangle), one would have supposed that in a few minutes every sign of fire would have been extinguished, the more so as the building was known to contain so many objects of incomparable value. Yet a precious hour was lost, during which not one bucket of water was thrown, not one fire-engine brought into service. The Spaniards are personally courageous, and those who went to the rescue risked their lives in the endeavor to save the arms. One narrow staircase only existed, and by this and by the windows the arms and armor from the long gallery were hurled pell-mell to the crowd below. But soon the smoke and fire became too strong, and suffocation threatened those engaged in the building; the roof frame was burnt through, and threatened to fall among the workers, and soon what remained of this most noble armory was buried among the burning and smoking fragments of the fallen roof. The loving, careful work of years and priceless treasure was irrevocably lost for want of a few gallons of water and a handy pump. Thanks, however, to those brave men, the more precious objects of the collection have been saved; many much damaged, it is true, but not much hopelessly. Some of the choicest armor and historical suits and swords, the gold Visigothic crowns, some of the banners from Lepanto, and that most precious illustrated manuscript catalogue of Charles V, referred to above, are among the salvage. But the extent of losses cannot yet be known. Nearly all the banners, all the rich and precious ancient stuffs used for clothing the mannequins, all the saddle-cloths, housings, and lambrequins, and the *chaises à porteurs* used by Charles V were burned.

There are some few learned and scientific men at Madrid, and some who love art and antiquity, to whom the rich Gallery of the Prado, the unfortunate Armeria, and other museums of the city are sources of pride and intellectual enjoyment; but, unfortunately such men are lost in the crowd of politicians, for politics in Spain is the mania of the day. Nevertheless, the emotion at the news of the catastrophe was great, and the Minister of the Interior was questioned upon the matter, and upon the existing (or rather non-existing) arrangements for the security of such collections of art and public buildings as the Gallery of the Prado, the Academy of St. Ferdinand, the Archæological Museum, the Royal Library, the Palace, etc., and the inadequacy and bad organization of the fire brigade was referred to. One would have expected that the Deputies and Senators of Spain would have immediately insisted on a proper inquiry being made, with the view of efficiently re-organizing the corps of Pompiers, and perfecting their engines and apparatus. Not so. The Minister of the Interior calmly rises in the Senate on July 11 to declare "that the service for the fire-engines of Madrid, say what they may, was far superior to that of most of the capitals of Europe," upon which the subject drops, and all-absorbing political discussion continues its usual endless course.

Here are some few of the consequences of Spanish negligence. To say nothing of the sale of national works of art and archives by Communes, and from churches, convents, etc., and of grand heirlooms and the like, let us see what has been lost by fire. In 1604, the Palace of the Prado was burnt, and with it some forty *chefs d'œuvres* by Titian, Antonio Moro, Coello, and others; the inventory of these lost historical portraits, etc., still exists. In 1734, the tower of the ancient Alcazar, the Palace of Charles V, and of Philip II, on the site of which now stands the present royal palace. A few years since the Escurial took fire in the roof of the Library, and some hundreds of manuscripts, etc., were destroyed or injured. The Alcazar of Toledo and that of Segovia were burned, and nothing saved. At the Royal Palace, in Madrid, where six hundred magnificent tapestries are stored and other precious objects; at the Picture Gallery of the Prado; at that of St. Ferdinand; at the National Library; at the Archæological Museum, there are neither a station of the fire-brigade, nor water-conduits, nor tanks, nor even buckets. Lightning conductors are rare and ill-constructed, but the cigarette is in every mouth. During winter braziers inadequately warm the rooms, and petroleum lamps are in use, for in many of such buildings the numerous keepers and their families are heedlessly lodged. No telegraphic system is at hand to raise alarm, nor do the keepers make their nightly round.

PRE-HISTORIC ARCHÆOLOGY IN AMERICA.

Old House at Newhaven. Drawn from Nature by C. P. Yarnall.

AN address was delivered by Dr. E. B. Tylor, as president of the section of Anthropology at the meeting of the British Association in Montreal, in which he referred to the relations between the eastern and western parts of the globe. The following is an extract:—

Of late no great progress has been made toward fixing a scale of calculation of the human period, but the arguments as to time required for alterations in valley-levels, changes of fauna, evolution of races, languages, and culture, seem to converge more conclusively than ever toward a human period, short indeed as a fraction of geological time, but long as compared with historical or chronological time. While, however, it is felt that length of time need not debar the anthropologist from hypotheses of development and migration, there is more caution as to assumptions of millions of years where no arithmetical basis exists, and less tendency to treat everything pre-historic as necessarily of extreme antiquity, such as, for instance, the Swiss lake-dwellings and the Central American temples.

There are certain problems of American anthropology which are not the less interesting for involving no considerations of high antiquity; indeed, they have the advantage of being within the check of history, though not themselves belonging to it. Humboldt's argument as to traces of Asiatic influence in Mexico is one of these. The four ages in the Aztec picture-writings, ending with catastrophes of the four elements, earth, fire, air, water, compared by him with the same scheme among the Banyans of Surat, is a strong piece of evidence, which would become yet stronger if the Hindoo book could be found from which the account is declared to have been taken. Not less cogent is his comparison of the zodiacs or calendar-cycles of Mexico and Central America with those of Eastern Asia, such as that by which the Japanese reckon the sixty-year cycle by combining the elements *seriatim* with the twelve animals, mouse, bull, tiger, hare, etc.; the present year is, I suppose, the second water-ape year, and the time of day is the goat-hour. Humboldt's case may be reinforced by the consideration of the magical employment of these zodiacs in the Old and New World. The

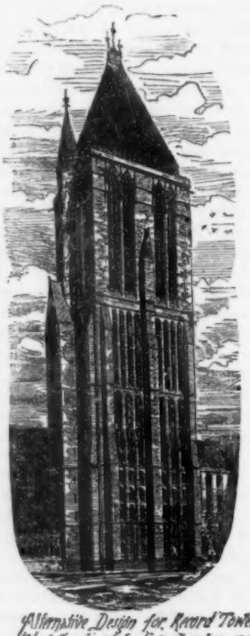
description of a Mexican astrologer, sent for to make the arrangements for a marriage by comparing the zodiac animals of the birthdays of bride and bridegroom, might have been written almost exactly of the modern Kalmuks; and in fact it seems connected in origin with similar rules in our own books of astrology. Magic is of great value in thus tracing communication, direct or indirect, between distant nations. The power of lasting and travelling which it possesses may be instanced by the rock-pictures from the sacred Roches Percées of Manitoba, sketched by Dr. Dawson, and published in his father's volume on "*Fossil Man*," with the proper caution that the pictures, or some of them, may be modern. Besides the rude pictures of deer, and Indians and their huts, one sees with surprise a pentagram more neatly drawn than that defective one which let Mephistopheles pass Faust's threshold, though it kept the demon in when he had got there. Whether the Indians of Manitoba learned the magic figure from the white man, or whether the white man did it himself in jest, it proves a line of intercourse stretching back two thousand five hundred years to the time when it was first drawn as a geometrical diagram of the school of Pythagoras.

To return to Humboldt's argument, if there was communication from Asia to Mexico before the Spanish Conquest, it ought to have brought other things, and no things travel more easily than games. I noticed some years ago that the Aztecs are described by the old Spanish writers as playing a game called patolli, where they moved stones on the squares of a cross-shaped mat, according to the throws of beans marked on one side. The description minutely corresponds with the Hindoo game of pachisi, played in like manner with cowries instead of beans; this game, which is an early variety of back-gammon, is well known in Asia, whence it seems to have found its way into America. From Mexico it passed into Sonora and Zacatecas, much broken down but retaining its name, and it may be traced still further into the game of plumbstones among the Iroquois and other tribes. Now, if the probability be granted that these various American notions come from Asia, their importation would not have to do with any remotely ancient connection between the two continents. The Hindoo element-catastrophes, the East-Asiatic zodiac-calendars, the game of back-gammon, seem none of them extremely old, and it may not be a thousand years since they reached America. These are cases in which we may reasonably suppose communication by seafarers, perhaps even in some of those junks which are brought across so often by the ocean current and wrecked on the Californian coast. In connection with ideas borrowed from Asia there arises the question, How did the Mexicans and Peruvians become possessed of bronze? Seeing how imperfectly it had established itself, not even dispossessing the stone implements, I have long believed it to be an Asiatic importation of no great antiquity, and it is with great satisfaction that I find such an authority on pre-historic archæology as Professor Worsaae comparing the bronze implements in China and Japan with those of Mexico and Peru, and declaring emphatically his opinion that bronze was a modern novelty introduced into America. While these items of Asiatic culture in America are so localized as to agree best with the hypothesis of communication far south across the Pacific, there are others which agree best with the routes far north. A remarkable piece of evidence pointed out by General Pitt-Rivers is the geographical distribution of the Tartar or composite bow, which in construction is unlike the long bow, being made of several pieces spliced together, and which is bent backwards to string it. This distinctly Asiatic form may be followed across the region of Behring's Straits into America, among the Esquimaux and northern Indians, so that it can hardly be doubted that its coming into America was by a northern line of migration. This important movement in culture may have taken place in remotely ancient times. A brief account may now be given of the present state of information as to movements of civilization within the double continent of America. Conspicuous among these is what may be called the northward drift of civilization, which comes well into view in the evidence of botanists as to cultivated plants. Maize, though allied to, and probably genetically connected with, an Old World graminaceous family, is distinctly American, and is believed by De Candolle to have been brought into cultivation in Peru, whence it was carried from tribe to tribe up into the North. To see how closely the two continents are connected in civilization, one need only look at the distribution on both of maize, tobacco and cacao. It is admitted as probable that from the Mexican and Central American region agriculture travelled northward, and became established among the native tribes. This direction may be clearly traced in a sketch of their agriculture, such as is given in Mr. Lucien Carr's paper on the "*Mounds of the Mississippi Valley*." The same staple cultivation passed on from place to place — maize, haricots, pumpkins for food, and tobacco for luxury. Agriculture among the Indians of the great lakes is plainly seen to have been an imported craft by the way in which it had spread to some tribes but not to others.

The distribution of the potter's art is similarly partial, some tribes making good earthen vessels, while others still boiled meat in its own skin with hot stones; so that it may well be supposed that the arts of growing corn and making the earthen pot to boil the hominy came together from the more civilized nations of the south. With this northward drift of civilization other facts harmonize. The researches of Buschmann, published by the Berlin Academy, show how Aztec words have become embedded in the languages of Sonora, New Mexico, and up the western side of the continent, which could not have spread there without Mexican intercourse extending far north-west. This indeed has left many traces still discernible in the industrial and decorative arts of the Pueblo Indians. Along the courses of this northward drift of culture remain two remarkable series of structures probably connected with it. The Casas Grandes, the fortified communal barracks (if I may so call them) which provided house-room for hundreds of families, excited the astonishment of the early Spanish explorers, but are only beginning to be thoroughly described now that such districts as the Taos Valley have come within reach by the railroads across to the Pacific. The accounts of these village forts and their inhabitants, drawn up by Major J. W. Powell, of the Bureau of Ethnology, and Mr. Putnam, of the Peabody Museum, disclose the old communistic society surviving in modern times, in instructive comment on the philosophers who are seeking to return to it. It would be premature in the present state of information to decide whether Mr. J. L. Morgan, in his work on the "Houses and House Life of the American Aborigenes," has realized the conditions of the problem. It is plausible to suppose, with him, a connection between the communal dwellings of the American Indians, such as the Iroquois long-house with its many family hearths, with the more solid buildings inhabited on a similar social principle by tribes such as the Zuñis of New Mexico. Morgan was so much a man of genius that his speculations, even when at variance with the general view of the facts, are always suggestive. This is the case with his attempt to account for the organization of the Aztec state as a highly-developed Indian tribal community, and even to explain the many-roomed stone palaces, as they are called, of Central America, as being huge communal dwellings like those of the Pueblo Indians.

I will not go further into the subject here, hoping that it may be debated in the section by those far better acquainted with the evidence. I need not, for the same reason, do much more than mention the mound-builders, nor enter largely on the literature which has grown up about them since the publication of the works of Squier and Davis. Now that the idea of their being a separate race of high antiquity has died out, and their earthworks with the implements and ornaments found among them are brought into comparison with those of other tribes of the country, they have settled into representatives of one of the most notable stages of the northward drift of culture among the indigenes of America.

EXPERIMENTS ON LIGHT-HOUSE ILLUMINANTS.



Alternative Design for Record Tower. New Courts of Justice. London. G.E. Street Archt.

THE committee appointed in England to report upon the relative merits of illuminants for light-houses, but which was dissolved, has been reappointed, and has taken the necessary steps toward carrying out an exhaustive series of experiments upon oil, gas and electricity. For this purpose they selected the South Foreland, where there are two light-houses illuminated by electricity, and which have been provided with an abundance of engine power. In connection with the experiments, remarks a foreign exchange, three temporary wooden towers have been constructed in a line landward, and bearing northwest from the permanent high light. These towers are marked A, B and C, and are respectively used for the electric, the gas and the oil light. Tower A is 245 feet from the high light, and tower B 180 feet from A, tower C being the same distance from B. The focal plane of all the towers is 15 feet below that of the electric high light, which is 380 feet above sea level. In the electric arrangements Baron de Meriton's arc lamps and magneto-electric machines are employed. At present there are two of these lamps and two of the machines in place, but another of each is to be added. The lamps are placed one above the other, or superposed, in the tower. The carbons used in them are compound — that is, they are made up of a number of small carbon rods of square section. Each of De Meriton's machines is arranged for working at one-fifth, two-fifths, three-fifths and at full power, the estimated intensity of the light from each machine at those powers being respectively 6,000, 12,000, 18,000 and 30,000 candles. The machines can either be worked singly or coupled up. The arrangements for illuminating tower B consists of a small gas-works erected by J. R. Wigham, of Dublin, whose burners are used in the tower, his system having been adopted for light-houses on the Irish coast. The gas-producing apparatus consists of a small retort-house fitted with two benches of three retorts, the necessary purifiers and a holder capable of containing 4,500 cubic feet of gas. The gas is passed through a meter

placed outside the tower to the burners within it, and which are four in number. Each burner is composed of a series of concentric rings of jets, and the light can be started with a minimum power of 28 jets, and increased by gradations of 20 jets up to 108 jets, the full power of each burner, at which it develops 3,000 candle power. There are four of these burners superposed, and they can be used either singly or together, the lights being designated uniform, biform, triform and quadriform, according to the number of burners in use at the same time. The objects of the variations of power in the lights in all cases is to meet the varying requirements of the atmosphere. In tower C oil lights are used, and these are produced by means of burners of the recognized Trinity House pattern. For this purpose nothing further is necessary than a tank outside the tower, containing a store of Scotch paraffine, and the lamps and burners in the tower.

The burners at present in use have six concentric wicks, each developing 720 candle power; but another burner of much higher power, having seven wicks, will shortly be tried. The burners are arranged in three stages, and either a uniform, a biform or a triform light can be exhibited as required. The burners are in duplicate on each stage, and by an ingenious arrangement the first lamp can be shunted out of position if necessary, and the second one lighted and shunted into its place without any appreciable loss of time.

Such are the arrangements for producing the various lights. For testing them, carefully elaborated arrangements have been made. An overland route has been laid down as a line of observation for a distance of two and one-half miles from the towers, and stakes have been driven at every one hundred feet. At half a mile from the towers on this route is hut No. 1, for taking photometric observations, and this is more particularly intended for fog work. At one-and-one-fourth miles is hut No. 2, which is likewise fitted with photometric apparatus. At the limit of the range is the third hut, each hut being conveniently fitted up for the residence of the official in charge. Arrangements have also been made for observations to be taken at the various coast-guards stations within the focal area, at Ramsgate and other contiguous places, and at various points out at sea, including the Gull and Varne light vessels, which are respectively 8 miles northeast and 12 miles southwest distant from South Foreland. The observers are supplied with books for recording their observations in tabular form, which will ultimately be collected and their contents collated for the information of the committee. Ranging over so wide an area, and involving so many investigations, the experiments will necessarily occupy several months, probably five or six. Every illuminant and variety of burner adapted for light-house illumination will be tested under every possible condition pertaining to itself and to the atmosphere. The most important point as regards atmospheric conditions will be fogs, which will have very careful consideration. — *The Iron Age.*

CIRCULARS OF THE DES MOINES ARCHITECTURAL ASSOCIATION.

CIRCULAR NO. 5.

THE undersigned committee in investigating, according to By-Law No. VII on unprofessional conduct, the charge made by the Editors of the *American Architect and Building News* in their issue of September 6th, a charge that would not be worthy of consideration, were it not for the injury it might work in hindering the advance of architecture in this country, have taken the wish of Charles Garnier at the late Paris dinner, as our line of action.

Our report of this dinner states that from among the crowd of good things that came from the lips of Garnier, these words are chosen as most valuable to the architectural profession.

"*Il espère bien que La Société centrale va étudier à fond la question, et qu'on n'entendra bientôt plus parler de récriminations, parce qu'il n'y en aura plus à faire.*"

We have to report that in an editorial that appeared August 16th at Boston, a *parallel* was made between the American Institute and the Central Society, when the demands of architecture in this country required that a *contrast* should be made. A member of the Des Moines Association, Charles H. Lee, demanded by letter, that, if the parallel existed, it should be examined more in detail.

That extremely good illustration that appears on the first page of Frank Leslie's paper, under date of August 30th, seems to suggest the situation, while that "Revel of the pocket" of the D. M. A., was in the condition of the pigeon-houses of the illustration, the *American Architect* seemed about to mount the foundation of the American architectural pyramid "a little too previous," and up a very rickety ladder; C. H. L. claims he "could not resist the temptation to kick it from under them." The committee of the Association would report that the predicament in which it has placed the *American Architect* is to be regretted, but that it was an unavoidable result.

The writer of the unpublished letter states that he did not consider that there were a number on the staff of the *Architect*, instead of one Rip Van Winkle as in the illustration, or he might have had some pity for the under man in the heap, especially, when he now considers the thousand and one bricks on top of them. The committee, however, would report, that the association should not consider as unseemly or as wasted either a smile or a tear, so long as architecture advances.

The committee further reports that the aim of the Association and the welfare of the *American Architect* are identical, and that it should be considered, as heretofore, second on our list of allies.

It is further suggested that a vote of thanks from the D. M. A. be tendered the *American Architect* for fixing the attention of American architects upon this renowned dinner, which, in the words of Garnier, we should investigate "*à fond.*"

Were the *Architect* open to suggestions, the committee would advise the use of a better ladder next time, for which one round at least exists in the new *Art* Scholarship Fund at New York city. See *Art Amateur*, September, 1884.

CHARLES TERRELL, } *Committee.*
W. L. PLACK, }

J. S. BLAKE, *President.* E. H. TAYLOR, *Secretary.*

DES MOINES, IA., September 12, 1884.

CIRCULAR NO. 6.

THE President of the D. M. A., fears that interruptions from Boston may continue. It is even hinted that they will accuse us of court-martialing the wrong man, and not be satisfied till we have court-martialed every one of our number.

Now there is much work to be done before the 12th of November.

We have paid all the respect to Boston she deserves: we have turned out all our corporal's guard for one court-martial, and we cannot afford to keep "the guard" on such duty any longer.

Besides it would not be *wise* to pull all the teeth out of the head of the lion to find the one that causes the most pain. The lion will have to grin and bear it: if will only make him roar the louder, and the architects of America need waking up.

With Jehovah first on our list of allies, Boston ought to be content to be second.

The profession however, cannot risk the possibility of any further hinderance from that quarter. Consider the necessity. We must call in a peacemaker.

Bartholdi there! Put your foot on Boston-town, and keep *ses poules trempés* more quiet, while we build a pyramid in the Mississippi Valley.

Gott mit uns. Don't you know our colors? We are Egyptians.

CHARLES TERRELL,
Late Chairman of the Court-Martial Committee.

Respectfully submitted by the Architectural Association of Des Moines, Ia.

J. S. BLAKE, *President.*
E. H. TAYLOR, *Secretary.*

September 15, 1884.

[WE have no more space for this sort of composition. — EDS. AMERICAN ARCHITECT.]

BASEMENT-FLOORS.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, — In a certain public building in Washington, there is a basement room enclosed with walls of masonry, and paved with hard brick; on the brick are laid strips, and on these strips a wood floor. The spaces between the strips (and the floor and pavement) are carefully *filled in with dirt.* Is this right? S. F.

[NO; the strips and floor, unless of cedar, will rot in a few years. The strips should have been laid on the brickwork, without filling between them, so as to get as much circulation of air as possible all about them, and under the floor boarding. It is not unusual to bore holes all around the edge of a floor laid on sleepers in this way, to promote movement of the air' — EDS. AMERICAN ARCHITECT.]

A PLAN WANTED.

MANSFIELD, O., September 16, 1884.

TO THE EDITORS OF THE AMERICAN ARCHITECT: —

Dear Sirs, —Among all your designs, I have never noticed one for an office such as are so often built on the same lot as the residence, by gentlemen, and especially by lawyers, doctors, and persons retired from active business. One having front office-room and rear office or library, designed by a competent architect, should, I think, excite general attention, as this is a line of architecture which is growing in importance. Respectfully, C. B. JAMESON,

[ALTHOUGH it seems to be evident that our correspondent is writing one word for the public and two for himself, we publish his suggestion. It will at any rate serve to discover how many architects are willing to do work for nothing; for if tales be true, he may expect to receive a superabundance of designs from which he can select without cost to himself. —EDS. AMERICAN ARCHITECT.]

BOOK ON INTERIOR DECORATION.

East Boston, Mass.

To the Editors of the American Architect: —

Dear Sirs, — Will you be kind enough to mention the best work on the coloring of rooms? I am building a home, and want instruction as to harmony of color, in painting interiors of house and tinting ceilings, etc. Respectfully yours, C. J. S.

[The best book of the kind that we know of is Dr. Christopher Dresser's "*Principles of Decorative Design*," which can probably be had of Estes & Lauriat, 301 Washington St., Boston, or of the publishers, Cassell, Petter & Galpin, New York. — Eds. American Architect.]

PILE-CAPPING STONES.

Hartford, Conn., September 22, 1884.

To the Editors of the American Architect: —

Dear Sirs,—Which is the better arrangement of pile footings for a heavy building, small stones, about 2′ 6″ x 2′ 6″, bearing on three piles, or a less number of 3′ 9″ x 5′ 0″ stones bearing on six piles?

Q.

[The small stones on three piles will be much the best. It would be next to impossible to set a stone so as to bear equally on six piles.— Eds. American Architect.]

NOTES AND CLIPPINGS.

A Paper Door.—A durable and weighty-looking door is now made of paper. While it costs about the same as wood it is much better, because there is no shrinking, swelling, cracking or warping. It is composed of two thick paper boards, stamped and moulded into panels and glued together with glue and potash, and then rolled through heavy rollers. It is first covered with a water-proof coating, and then with a fire-proof coating, and is painted and varnished, and hung in the ordinary way.— *Exchange.*

An Old Dutch Brick. — In removing some rubbish from the New York City Library recently, the workmen found a curious brick, on which a paper was pasted bearing the following inscription: "This brick was made in Holland, and is one of those given by the city of New York to Thomas Willett, their first mayor, with which to erect his chimney on his plantation in Swansey (now Seekonk), Mass., on his return from New York about the year 1666. The chimney of a house rebuilt on the same site about the year 1771 is mostly composed of the same bricks. A. D. 1841." — *Boston Transcript.*

An Electric Light-House in Brazil. — An electric light-house has recently been erected on the Island of Raza, at the entrance of the Bay of Rio Janeiro. The light-house proper is eighty-five feet high, and is put upon a rock two hundred and thirty feet in height, so that the focus of the light of the apparatus is fixed at an elevation of three hundred and fifteen feet above the sea. The electric current is produced by a continuous-current Gramme machine, working at the rate of seven hundred revolutions, and feeding a light of two thousand candle power. The Gramme machine referred to is worked by a stationary surface-condensing steam-engine, this arrangement being inevitable, owing to the want of fresh water. All the fittings are double, so as to prevent interruptions by unforeseen accidents, and, to make assurance doubly sure, an oil-lamp is always kept in readiness. The light is revolving, having two white discs and one red one, succeeding one another at fifteen minutes' interval, and the light is visible at a distance of about thirty-five statute miles. — *Manufacturers' Gazette.*

Literary Finds. — Chance literature has a strikingly romantic aspect. Many of the greatest discoveries in the era of the revival of learning were characterized by the merest chance. Cicero's important treatise, "*De Republica*," was discovered concealed beneath some monastic writing. Part of Livy was found between the leaves of a Bible, and a missing page in a battledore. Quintilian was picked out of an old coffer full of rubbish. The one copy of Tacitus which survived the general destruction of Roman libraries was found in a Westphalian monastery. An original Magna Charta, with all its seals and signatures, was found by Cotton, about to be cut up by a tailor into measures. Thurloe's State papers fell out of a ceiling in Lincoln's Inn. Many of Lady Montagu's letters were discovered by Disraeli in the office of an attorney, where they might have remained till this day but for the chance visit of the great bibliophile. And undoubtedly many hundreds of rare books and manuscripts and papers lie hidden away in the presses and cupboards of old manor-houses, whence gradually they may be dragged into the light of day, to be destroyed or to awaken universal interest. No one could have read without emotion how the poor fellows who made up the last struggling remnant of the Greely expedition read with avidity the newspaper wrappings of the lemons they ate. Yet when we recall occasions in our own lives when we have been absolutely dependent upon our own resources for means wherewith to kill time, we can appreciate it. Toward the close of a long voyage, even under modern luxurious conditions, the humblest of chance literature is greedily seized upon; the odd volume of a novel, the mangled remains of a book of poems, a file of very old newspapers — anything, in fact, which is printed — means the disposal of otherwise dreary, monotonous hours. Subjects in which hitherto we have not taken the smallest interest become fascinating; we learn to love a detested author, we skip not a word, and it may be said that many a man has developed a new taste or acquired a new hobby-horse from the perusal of chance literature under such circumstances. Hence we find that sea-skippers are so often well informed on many subjects outside their profession; that lighthouse keepers are sometimes scientific men and linguists; that turnpike keepers are often men of no mean attainments.—*London Globe.*

A Germ Filter for Water. — The tendency of research is to show that the germs believed to cause so many diseases are not found in the air, except under exceptional circumstances, but exist chiefly in water. This is probably due to the fact that rain and filtration eventually bring the products of fermentation and decomposition into the watercourses. Water may, therefore, be considered as one of the principal agents in the propagation of such diseases; and M. Chamberland has recently turned his attention to the production of a microbe filter, which would purify water not only from its mineral but its animal impurities. M. Pasteur has employed a porous vase of baked porcelain to separate microbes from the medium in which they are generated, and this is the basis of M. Chamberland's filter. The latter has observed that water filtered through one of these vases contains neither microbes nor their germs; and the proof of it is that such water can be added in any proportion to susceptible liquids without causing any change in them. The apparatus of M. Chamberland, which was recently brought before the French Academy of Sciences, can be fitted directly to any water-pipe, and acts by the pressure existing in the latter. Under a pressure of of about two atmospheres, which is the pressure in M. Pasteur's laboratory, M. Chamberland obtains with a single porous tube or "filtering candle" (as he calls it) twenty centimetres long and twenty-five millimetres in diameter, some twenty litres (about four gallons) of pure water per day, that is to say, a sufficient quantity for the uses of an ordinary household. By multiplying the number of candles or filter-pipes, so as to form sets or "batteries" of them, a supply of pure water sufficient for a school, hospital, works, or barracks, can be obtained. The filter, therefore, is of a practical kind, and being simple and inexpensive, will supply a much felt want. The filter is cleaned by brushing its external surface, and plunging it into boiling water, or by heating it directly in a fire to destroy the organic matter lodged in it; and properly cleaned the same tube will last indefinitely. While upon this subject we may mention that electricity has been suggested as a means of ridding water of microbes, and a filter which electrifies the water has actually been designed and constructed. — *Engineering.*

A Large Grain-Elevator.—The largest grain-elevator in the world, says the *Nashville American*, is that just constructed at Newport News, under the auspices of the Chesapeake & Ohio Railway Company. It is 90 feet wide, 386 feet long, and about 164 feet high, with engine and boiler rooms 40 x 100 feet, and 40 feet high. In its construction there were used about 3,000 piles, 100,000 feet of white-oak timber, 82,000 cubic feet of stone, 800,000 brick, 6,000,000 feet of pine and spruce lumber, 4,500 kegs of nails, six large boilers, two large engines, 200 tons of machinery, twenty large hopper-scales, and 17,200 feet of rubber belts, in sizes varying from 8 to 48 inches in width, and from 50 to 1,700 feet in length; and, in addition, there were 8,000 elevator-buckets and other material used in building such structures. The storage capacity of the house is 1,600,000 bushels, with a receiving capacity of 30,000, and a shipping capacity of 20,000 bushels per hour.

Contamination of the Washington Water-Supply. — There is quite a local fright at the threatened impurity of the water-supply of this city. The Superintendent of the Canal, who resides in Cumberland, states that the Potomac River, from Harper's Ferry to Seneca, is full of dead hogs, and that there are at least one thousand carcasses in the river and canal at present, and that the farmers in the sections where the hog cholera is raging do not hesitate to throw the carcasses into the river. The Health Officer will take such steps as are possible to prevent the threatened danger to the health of Washington. The aqueduct is to be flushed at once, and appeals are to be made to the Governors of Maryland and Virginia to intercede to prevent this outrage.

Proposed Statue of Louis XIV at Munich. — Great indignation is expressed in Munich over the intention of King Louis II, the music-mad monarch of Bavaria, to erect a colossal equestrian statue of King Louis XIV of France, in one of the squares of the Bavarian capital. The objectors say that the man whom it is proposed to honor was always the arch-enemy of Germany, and that his warfare and aggressions upon the German people were more causeless and wanton than those of any French monarch who preceded or followed him. Threats are openly made that if King Louis persists in his determination to erect the statue, it will be found demolished within a few nights after its inauguration. — *Boston Journal.*

The Last of another of Wren's Churches. — The Church of St. Olave, Old Jewry, one of Wren's London buildings, is doomed. There were two more religious houses dedicated to the Norwegian king, one in Hart Street, where Pepys went to church, and the other in Silver Street, not rebuilt after the great fire. A fourth was on the opposite bank of the Thames. The ruin of St. Antholin, in Watling Street, another church by Wren, is considered by the *Saturday Review* to be the greatest architectural loss that London has suffered since the great fire. "It was one of the most singular and grotesque pieces of vandalism ever perpetrated in a civilized country."

The Greek Church at Sitka. — A Minneapolis artist, who has been "doing" Alaska during the summer, says that all the members of his party, and there were seventy-five of them, agreed that the Greek church at Sitka is the finest church in America. It is built on the plan of a Greek cross, and the interior is a mass of gold and silver, of the magnificence of which a writer says he can give no idea. The walls are hung with pictures of royalty and the priesthood, sent by a Russian princess, who took this temple under her patronage.—*New York Commercial Advertiser.*

A Hint for Tax-Dodgers. — In Mianus, Conn., there is a house built twenty-five years ago by a man named Van Nostrand, who has lived in it all these years without removing the scaffolding that was used in its erection. Only part of the rooms are finished, and it is said that the house was left in that condition to escape the payment of taxes.

SUMMARY OF THE WEEK.

Baltimore.

BUILDING PERMITS.—Since our last report thirty-five permits have been granted, the more important of which are the following: —

J. G. Sauer, three-st'y brick building, n s Lombard St., between Bond and Dallas Sts.

Henry Borgman, 6 two-st'y brick buildings (square), e s Madeira Alley, between Monument and McElderry Sts., and 5 two-st'y brick buildings, w s Patterson Park Ave., between Monument and McElderry Sts.

Irvin W. Carter, 6 two-st'y brick buildings, commencing n w cor. Fulton Ave. and Wilhelm St.

P. Cassidy, three-st'y brick building, n e cor. Chase and Valley Sts.

Broderick Bros., three-st'y brick warehouse and one-st'y brick shop, n s Pratt St., w of Green St.

W. Nissler, three-st'y brick building, n s Chew St., between Bond St. and Broadway.

Jno. Magarity, 4 three-st'y brick buildings, n s Preston St., w of Broadway.

Jas. P. Rock, 3 two-st'y brick buildings, commencing n w cor. Monument St. and Jew Alley.

E. W. Haviland, 4 two-st'y brick buildings, w s Winder St., between Hanover St. and Godman Alley, 4 two-st'y brick buildings, n s McComas St., between Hanover St. and Goodman Alley, and 16 two-st'y brick buildings, w s Goodman Alley, between Winder and McComas Sts.

Wm. Carback, 2 two-st'y brick buildings, w s Chapel St., between Chew and Eager Sts.

Wm. T. Phillips, 6 three-st'y brick buildings, commencing s w cor. Franklin St. and Arlington Ave., and 5 three-st'y brick buildings, w s Arlington Ave., s of above.

Wm. A. Brooks, 7 three-st'y brick buildings, e s Barclay St., n of Townsend St.

Boston.

BUILDING PERMITS.—*Pleasant St.*, n South St., Ward 24, for Wm. Donaldson, brick dwell., 12′ x 36′ and 32′ x 34′, flat; Wm. Donaldson, builder.

Station St., cor. Halleck St., Ward 22, for A. J. Houghton & Co., brick office, 25′ x 40′, hip.

Cumberland St., cor. St. Botolph St., Ward 11, for T. E. Thompson, 2 brick dwells., 30′ x 45, flat; J. E. Potter, builder.

West Camden St., *No.* 212, Ward 19, for Standard Cordage Co., brick office, 20′ x 20′, pitch; H. Drake, builder.

East Fifth St., *Nos.* 704–706, for H. B. Stratton, 2 dwells., 22′ x 50′ flat; H. B. Stratton, builder.

Tremont St., *No.* 1382, Ward 19, for S. Emmes, storage; A. McLean, builder.

Meridian St., cor. Conder St., Ward 1, for R. Gavner, dwell. and store, 24′ x 31′, flat, E. Heustis, builder.

Adams St., n Dix St., Ward 24, for M. A. King, 2 dwells., 12′ x16′ and 21′ x 28′, pitch; Gilbert & White, builders.

New Seaver St., *No.* 8, Ward 24, for Chas. Jenkins, 2 dwells., 20′ x 29′, pitch; J. Philbrick, builder.

Forest Hill Ave., w s, Ward 24, for D. S. Black, dwell., 20′ x 48′, pitch; A. H. Pierce, builder.

Lyndon St., cor. Syeph Ct., Ward 19, for George Kampe, dwell., 13′ x 28′ and 23′ x 27′, flat; V. Bock, builder.

Cambridge St., n Parker St., Ward 4, for A. Stone, dwell. and store, 25′ x 40′, flat; N. J. McLean, White builder.

Oak St., cor. Farrington Ave., Ward 23, for Chas. F. Koopman, dwell., 10′ x 18′ and 27′ x 30′, pitch; W. S. Mitchell, builder.

Congress St., n A, Ward 13, for N. E. Tel. & Tel. Co., mechanical and storage, 22′ x 200′, pitch; F. A. Bruce, builder.

Brooklyn.

BUILDING PERMITS. — *Middagh St.*, *No.* 49, four-st'y brick tenement, tin roof; cost, $4,000; owner, Alfred Haiden, 155 Bridge St.; builder, W. J. Rogers.

Van Buren St., s s, 100′ e Broadway, 6 two-st'y frame (brick filled) dwells.; cost, each, $3,500; owner and builder, Samuel Post, Broadway, cor. Van Buren St.; architect, H. Vollweiler.

Tompkins Ave., s w cor. Quincy St., 5 three-st'y and four-st'y brown-stone stores and dwells., tin roofs; cost, each, $6,000; owners, Messrs. Stewart & Hubbell, 373 Quincy St.; architect, E. G. Gaylor; builder, J. M. Stewart.

Douglas St., *No.* 155, being 250′ e Bond St., three-st'y brick tenement, tin roof, wooden cornice; cost, $4,000; owner, architect and builder, J. M. O'Neill, 119 Hoyt St.

Herkimer St., s s, 28′ e Bedford Ave., 2 three-st'y brown-stone dwells., tin roofs; cost, each, $7,000; owner, M. E. Stafford, 48 Herkimer St.; architect, A. Hill; builder, John Stafford.

Madison St., s s, 440′ e Tompkins Ave., 3 two-st'y dwells., tin roofs, wooden cornices; cost, each, $4,500; owner, architect and builder, Chas. Isbill, 593 Herkimer St.

Stanhope St., s s, 216′ e Evergreen Ave., two-st'y dwell., tin roof; cost, $3,500; owner, F. But, Flushing Ave.; builder, G. C. Brada.

Broadway, w s, 83′ n Willoughby Ave., 3 three-st'y brick stores and dwells., tin roofs; cost, each, $6,000; owner and builder, Fr. Herr, 778 Broadway; architect, J. Herr.

Stockton St., *No.* 306, s s, 207′ e Sumner Ave., three-st'y frame (brick filled) tenement, tin roof; cost, $3,500; owner and builder, George Straub, 11 Lewis Ave.; architect, Th. Engelhardt.

Stockton St., *Nos.* 308–314, s s, 208′ 6″ e Sumner Ave., 4 three-st'y frame (brick filled) tenements, tin roofs; cost, each, $4,200; owner, builder and architect, same as last.

Henry St., n w cor. Harrison St., 5 four-st'y brown-stone tenements, tin roofs; cost, each, $12,000; owner and builder, Cornelius Donellon, Pacific St., near Henry St.; architect, Geo. P. Chappell.

Oakland St., w s, 50′ s Huron St., three-st'y frame (brick filled) tenement, gravel roof; cost, $4,300; owner, John McHenry, 184 Huron St.; architect, J. Mulhall; builders, Post & Walker.

Leonard St., w s, 150′ n Calyer St., 2 three-st'y frame tenements, gravel roofs; cost, $10,000; owner, Julia Duryea, 118 Oak St.; architect, F. Weber; builders, Post & Walker.

Harrison St., n s, 70′ w Henry St., four-st'y brick tenement, tin roof; cost, $12,000; owner and builder, Cornelius Donellon, Pacific St., near Henry St.; architect, G. P. Chappell.

North Second St., *No.* 125, n s, 30′ e Third St., four-st'y brick tenement, tin roof; cost, $5,000; owner and builder, Patrick Harden, s e cor. North Second and Third Sts.; architect, A. Herbert.

India St., s s, 100′ e Manhattan Ave., two-st'y brick school, tin roof; cost, abt. $7,000; owner, P. F. O'Hare, Manhattan Ave.; architect, E. P. Mahoney; builders, John Hafford & Son and John Quigley.

Chicago.

HOUSES. — Furst & Rudolph, architects, have completed plans for dwell., to be erected on Ashland Ave. and York St., for L. Russ, Milwaukee pressed-brick, Carbondale stone front, slate roof; cost, $35,000.

Two houses to be built on Ashland Ave., near Van Buren St., for M. Hirsh, were planned by the same architects, Anderson pressed-brick, brown-stone trimmings; cost, $25,000.

STORES AND FLATS. — Architects Furst & Rudolph planned the stores and flats now building for Heissler & Junge, at State and Twenty-fourth Sts., 100′ x 125′, four-st'y, Anderson pressed-brick, stone trimmings and terra-cotta; cost, about $55,000.

CHURCH. — Furst & Rudolph planned the Lutheran Church at Lake View, 50′ x 90′, to be built of pressed-brick.

BUILDING PERMITS. — E. Wilhelm, two-st'y dwell., 27 Huribut St.; cost, $3,800; architect, C. Bruntz; builder, M. Zipprich.

F. Gebhardt, two-st'y dwell., 702 West North Ave.; cost, $2,500.

C. A. Blaurock, three-st'y store and flats, 1010 West Harrison St.; cost, $3,500; architect, W. H. Fraser.

J. M. Faalhaber, three-st'y dwell., 526 North Clark St.; cost, $15,000; architect, Otto Matz; builder, G. Soefke.

J. Batterman, three-st'y dwell., Ashland Ave.; cost, $6,500.

M. A. Smith, two-st'y dwell., 345 South Robey St.; cost, $4,000; architect, J. Austin.

L. S. Diller, 5 two-st'y dwells., 88 to 96 North Weston Ave.; cost, $9,000; architect, H. F. Clay.

Women's Hospital and Dormitory, four-st'y hospital, Adams and Paulina Sts.; cost, $40,000.

J. H. Batterman, two-st'y dwell., 457 Dearborn Ave.; cost, $5,000; architect, J. H. Huber; builders, McCarthy & Co.

F. Koephe, two-st'y dwell., 689 North Paulina St.; cost, $3,500.

H. Kunze, two-st'y store and dwell., 70 East North Ave.; cost, $4,500.

H. Rieper, 2 three-st'y dwells., 14 Fowler St.; cost, $4,000.

J. Spry, 2 two-st'y'dwells., 112 and 114 Sangamon St.; cost, $7,000.

P. Becker, 2 two-st'y stores and dwells.; cost, $6,000.

J. Raber, three-st'y store and dwell., State St.; cost, $10,000; architect, J. F. Doerr; builder, M. Schmidt.

Traders' Safe and Trust Company, seven-st'y office-building, 5 to 11 Pacific Ave.; cost, $25,000; architects, Burnham & Root; builder, E. Sturtevant.

W. Rosenstiell, two-st'y store and dwell., 311 West Division St.; cost, $2,500.

J. & F. Rutten, two-st'y dwell., 909 Thirty-eighth St.; cost, $2,500.

M. Adams, three-st'y dwell., 7 Lane Pl.; cost, $8,000; architect, G. Spohr; builder, D. Wilkie.

W. Wuestenfeld, two-st'y store and dwell., 146 Webster Ave.; cost, $8,000; architect, Stanger.

Armour, Dole & Co., corn-crib, Morgan St.; cost, $80,000; architects, Baumann & Lotz.

L. W. Foley, 4 cottages, 57 North Western Ave.; cost, $2,600.

Wm. Lange, three-st'y store and dwell., 3206 State St.; cost, $8,000.

Garner Bros., 2 three-st'y stores and dwells, 553 and 555 Hanover St.; cost, $6,000.

F. Dierssen, two-st'y addition, 26 and 28 North Canal St.; cost, $3,500.

Geo. E. Cave, two-st'y store and dwell., 3829 South State St.; cost, $5,500.

H. Wollner, two-st'y store and dwell., 3362 Halsted St.; cost, $3,500.

J. M. Mandry, two-st'y dwell., 669 Twenty-second St.; cost, $3,800.

Lendgran, Ritchie & Ecklan, 4 three-st'y dwells., 3 to 9 Sedgwick St.; cost, $12,000.

Wm. Baragwanath, one-st'y boiler-shop, 50 to 54 West Division St.; cost, $15,000.

Mrs. J. Schmidbaum, two-st'y store and dwell., 116 Hastings St.; cost, $3,800.

Geo. Ralphs, two-st'y dwell., 33 Ewing St.; cost, $7,000; architects, Frohmann & Jebson; builder, Chas. Kreifer.

W. Thomas, two-st'y dwell., 936 Adams St.; cost, $6,000; architect, W. Thomas; builder, D. H. Hays.

Chas. Rowan, two-st'y dwell., 351 Centre Ave.; cost, $3,500.

A. Ross, 2 two-st'y dwells., 63 and 65 Florinel St.; cost, $5,000.

M. Markig, three-st'y dwell., 299 Hudson Ave.; cost, $3,800.

W. E. Dankert, two-st'y dwell., 216 Evergreen St.; cost, $3,500.

E. C. Huling, two-st'y store and dwell., 944 North Ashland Ave.; cost, $3,000; architects, Wheelock & Clay.

Mrs. E. Williams, two-st'y dwell., 3200 South Park Ave.; cost, $10,000; architect, L. G. Halberg; builder, A. G. Hageman.

T. Goodwin, two-st'y dwell., 359 West Huron St.; cost, $3,400.

C. A. Niebuhr, three-st'y store and dwell., 170 Larrabee St.; cost, $7,000; architect, Ottar; builder, M. Zipprich.

W. S. Grannis, 2 two-st'y dwells., 1033 and 1035 West Jackson St.; cost, $5,000.

J. Kruse, store, 238 Evergreen Ave.; cost, $3,000.

J. Caley, two-st'y store and dwell., 1561 Milwaukee Ave.; cost, $4,500; architect, Cockeran.

C. H. Starkweather, four-st'y dwell., 209 Third Ave.; cost, $6,500.

K. A. Langeland, two-st'y dwell., 570 Seventeenth St.; cost, $2,500.

Wm. Mullen, two-st'y dwell., 495 Thirteenth St.; cost, $2,500.

Barrett & Barrett, four-st'y warehouse, 260 and 262 Kinzie St.; cost, $8,000.

J. L. Campbell, 4 two-st'y dwells., 287 to 291 Flournoy St.; cost, $12,000.

P. Grady, two-st'y dwell., 433 West Harrison St.; cost, $4,000; architect, Halberg; builder, A. Biemort.

J. Viles, 2 three-st'y stores and dwells., 3709 and 3711 State St.; cost, $12,000.

Geo. Manning, two-st'y dwell., 391 Thirty-sixth St.; cost, $3,000.

Turner & Bond, 15 cottages, Parnell Ave., near Thirty-first St.; cost, $20,000.

H. Korithy, 2 three-st'y stores and flats, 1146 and 1148 Southwestern Ave.; cost, $11,000.

Des Moines.

ADDITION.—Hawthorn school-house, brick and stone; cost, $6,000.

BUSINESS BLOCKS. — C. Youngman, four-st'y pressed-brick front on Locust St.; cost, $25,000.

D. Leham, three-st'y and basement brick, on Fourth St.; cost $13,000.

CHURCH. — Episcopal. Sioux Falls and red rock trimmed with buff sandstone; Gothic; cost, $40,000.

FACTORY.—I. M. Christy, three-st'y and basement on Twenty-ninth St.; cost, $9,000.

SCHOOL. — On North Twelfth St., three-st'y brick and stone building; cost, $16,000.

HOUSES. — H. D. Hedge, three-st'y Queen Anne, on Greenmount Ave.; cost, $10,000.

L. Sherman, three-st'y frame, on Woodland Ave.; cost, $15,000.

C. Howell, two-st'y frame, in North Des Moines; cost, $4,500.

C. H. Getchell, 2 double brick residences, on North Ninth St.; cost, $7,000.

Foster & Liebbe, architects, for all the above.

Detroit.

BUILDING PERMITS. — A. C. Varney, roller skating rink, West High St.; cost, $15,000.

Galvin Brass & Iron Works, factory, cor. Warren Ave. and Twelfth St.; cost, $12,000.

A. C. Varney, double brick dwell., 301 and 303 Second St.; cost, $7,000.

A. C. Varney, block, Nos. 486–502 Brush St.; cost, $18,000.

C. W. Potter, dwell. on Garfield St.; cost, $6,600.

C. B. Cole, brick dwell., No. 89 Fremont St.; cost, $4,000.

William Parker, packing-house, Rost St.; cost, $12,000; Jos. Moross, contractor.

C. B. Cole, dwell., West Willis Ave.; cost, $5,000.

A. C. Skinner, additions to Abstract Building, Lafayette Ave.; cost, $6,000.

This is an unusually dull season for building operations in Detroit.

Milwaukee, Wis.

LUMBER. — The movement of lumber during the past season has been on a larger scale than in the same period last year, while shingles and laths show a falling off. Prices have undergone very little change, and yard rates at the close are about the same as in 1883. The cargo trade has been concentrated in a few hands, both here and at Chicago, and sales are no longer to be obtained. Stocks on hand are liberal, and dealers here sell at lower figures than are quoted at Chicago.

Wholesale yard rates at the close of the season compare with those of last year as follows: —

	1883.	1884.
First and second clear, 3-inch	$48.00	$48.00
First and second clear, 2-inch	48.00	48.00
First and second clear, 1½ to 2 inch	45.00	45.00
Third clear, 1½ to 1½ inch	46.00	44.00
A, select, 1½, 1½, and 2 inch	40.00	40.00
B, select, 1½, 1½ and 2 inch	33.00	33.00
B, select, 2 x 4	27.00	27.00
A stock-boards, 12 to 16 feet, 12-inch	40.00	39.00
B stock-boards, 12 to 16 feet, 12-inch	36.00	36.00
C stock-boards, 12 to 16 feet, 12-inch	31.00	31.00
D stock-boards, 12 to 16 feet, 12-inch	20.00	18.00
A box, 13-inch and upward	46.00	45.00
B box, 13-inch and upward	41.00	41.00
C box, 13-inch and upward	31.00	31.00
Flooring, first common, 6-inch	36.00	34.00
Flooring, second common, 6-inch	33.00	32.00
Narrow, common, dressed and match'd,	17.00	15.00
Siding, first and second clears, 12 to 16 feet	22.00	21.00
Siding, first common	21.00	20.00
Siding, second common	18.00	18.00
Common boards, 18 to 20 feet, 12-inch	18.00	12.50
Common boards, 10, 12 and 20 feet, 12-inch	14.50	12.50
Common boards, 14 to 18 feet, 12-inch	14.00	12.50
No. 2 boards, 12 to 18 feet	12.00	11.00
Fencing, first, 12 to 20 feet	15.00	14.00
Fencing No. 2, 12 to 18 feet	11.00	11.00
Two-inch joist and scantling, 12 to 14 feet	13.50	12.00
Two by four, 2 x 8, 3 x 12, 12 to 16 feet	12.50	11.50
Timber, 4 x 4 to 8 x 8, 12 to 16 feet	13.50	12.00
Small timber, 2 x 4, 4 x 4, 10 to 20 feet	15.00	13.00
Cull plank, 2-inch	9.00	8.00
Pickets, flat, rough, good	8.00	8.00
Pickets, fancy head and dressed, selected	18.00	18.00
Shingles, extra A	3.00	2.50
Shingles, choice A	2.75	2.30
Shingles, standard A	2.50	2.20
Lath, dry	2.50	2.10

New York.

ENGINE-HOUSE. — Mr. George Ehret will have built an engine-house and a boiler-house on his premises, on Ninety-third St., from designs of Mr. A. Pfund.

They will be of brick and stone, and cost about $30,000.

FACTORIES.—On Seventy-sixth St., e of Third Ave., a five-st'y brick cigar-factory, 50′ x 100′, is to be built for Mr. S. T. Meyer, from plans of Messrs. I. W. Marshall and J. W. Walther; and on the n e cor. of Ave. A and Seventy-fifth St., a five-st'y brick cigar-factory, 25′ x 82′, is to be built for Mr. P. H. McManus, from designs of Mr. John Brandt.

SCHOOLS.—The Board of Education are having plans drawn by Mr. Stagg for additional schools.

RESIDENCES.—On the s s of One Hundred and Thirty-third St., between Sixth and Seventh Aves., 3 three-st'y and basement brown-stone residences, 16′ 8″ x 50′ each, are to be built, at a cost of $25,000 each, for Mr. S. T. Bennet.

On the s s of Sixty-fourth St., e of Tenth Ave., Mr. David H. King, Jr., will build, on a lot 100′ x 125′, a number of residences, three stories and basement.

BUILDING PERMITS.—*Fifty-fourth St.*, s s, 175′ e Eleventh Ave., five-st'y brick tenement, tin roof; cost, $15,500; owner, Chas. Wein, 513 West Sixtieth St.; architect, M. L. Ungrich.

Eighth Ave., cor. Sixty-first St., Broadway and Circle, one-st'y brick skating-rink, gravel roof; cost, $50,000; agent and attorney for owners, Fred. B. Jennings, 57 East Fifty-fifth St. or 2 Nassau St.; architect, G. L. Morse.

One Hundred and Forty-second St., 481′ 6″ e Alexander Ave., four-st'y brick tenement, tin roof; cost, $8,000; owner and builder, Augustus Gareiss, 639 East One Hundred and Forty-first St.; architect, Carl Pfeiffer.

Lexington Ave., s e cor. One Hundred and Twenty-fifth St., one-st'y brick skating-rink, tin roof; cost, $18,000; owner, Wm. A. Martin, 128 West One Hundred and Twenty-third St.; architect, Jos. M. Dunn.

Fulton Ave., e s, 227′ s One Hundred and Seventieth St., 3 two-st'y frame dwells., tin roofs; cost, each, $4,000; owner, Henry Kuhl, One Hundred and Sixty-fourth St.; architect, Theo. E. Thomson.

Seventieth St., w s, 74′ e Second Ave., 3 five-st'y brown-stone front flats, tin roofs; cost, each, $18,000; owner, Mrs. Ann Mulholland, 1324 Lexington Ave.; architect, John C. Burne.

Main St., Nos. 1670 *to* 1678, *West Farms*, one-st'y brick building (gas-works), slate roof; cost, $5,400; owner, The Northern Gas-Light Co., on premises; architect, H. S. Baker; builders, Brady & Zent and John Anderson.

One Hundredth St., 100′ w Eighth Ave., three-st'y brick stable and wagon-house, tin roof; cost, $15,000; owner, Margaretta Eggers, 1503 Third Ave.; architect, J. Kastner.

Sixty-seventh St., n s, 190′ w Third Ave., six-st'y brick and iron hook and ladder company's house, school and telegraph headquarters for Fire Department, brick and tile roof; cost, $50,000; owner, City of New York, for Fire Department, 155 Mercer St.; architects, N. Le Brun & Son.

One Hundred and Twenty-seventh St., s s, 125′ e Seventh Ave., three-st'y brick stable, tin roof; cost, $30,000; owner, architect and builder, Wm. J. Merritt, 113 West One Hundred and Twenty-eighth St.

One Hundred and Twenty-seventh St., s s, 185′ e Seventh Ave., four-st'y brick dwell., tin roof; cost, $15,000; owner, architect and builder, same as last.

One Hundred and Sixth St., n s, 325′ w Ninth Ave., three-st'y and attic brick asylum, tin and slate roof; cost, $75,000; owners, Little Sisters of the Poor, Sister Blanche de St. Marie, 207 East Seventieth St.; architects, D. & J. Jardine; builders, J. W. Hogencamp & Son and John Geagan.

Madison St., No. 397, five-st'y brick tenement, tin roof; cost, $7,000; owner, Jas. Reed, 553 Grand St.; architect, Chas. Sturtzkober.

Seventy-seventh St., n s, 50′ w Lexington Ave., five-st'y brick flat, tin roof; cost, $20,000; owner, Annie E. Kelly, 228 East Eightieth St.; architect, G. A. Schellenger.

First Ave., w s, 51′ s Seventy-third St., five-st'y brown-stone front tenement, tin roof; cost, $16,500; owner, Patrick H. McManus, 110 East Ninety-first St.; architect, John Brandt.

East Eighteenth St., Nos. 520 *and* 522, two and part three st'y brick stable and dwell., tin roof; owner, John Kehoe, 522 East Eighteenth St.; architect, F. W. Klemt.

ALTERATIONS.—*Cherry St., Nos.* 297 *and* 299, raise one-st'y; cost, $8,000; owner, Amos Morrill, 6 East Sixty-seventh St.; architect, Albert Wagner; builders, Van Dolsen & Arnot and Henry Schiffer.

Barclay St., s e cor. Church St., two-st'y brick extension, tin roof; cost, $3,500; owner, St. Peter's Church, on premises; architects, Renwick, Aspinwall & Russell.

Philadelphia.

BUILDING PERMITS.—*Merion Ave.*, e of Wyalusing Ave., 7 two-st'y dwells., 15′ x 37′; Jno. Buteson, Jr., owner.

Mascher St., s of Ontario St., 5 two-st'y dwells., 16′ and 19′ x 41′; Job Rutter, contractor.

Garfield St., bet. Main and Wakefield Sts., 2 two-st'y dwells., 14′ x 36′; C. O. Roop, contractor.

Broad St., cor. Reed St., one-st'y Baptist Church, 75′ x 97′; R. Q. Gibbon, contractor.

Frankford Road, s of Wishart St., two-st'y dwell., 16′ x 50′; Jno. S. Bald & Son, contractors.

Lehman St., bet. Little Wayne and Godfrey Sts., 2 two-st'y dwells., 14′ 6″ x 30′; Wm. Axford, owner.

Marshal St., cor. Huntingdon St., three-st'y dwell., 20′ x 50′; F. Albrecht, contractor.

Somerset St., near Haverford St., one-st'y workshop, 115′ x 126′; West Phila. Passenger R. W. Co., owners.

Eleventh St., s of Wharton St., 3 two-st'y dwells., 15′ x 42′; W. N. Rowan, owner.

North Twenty-second St., No. 203, two-st'y mill, 70′ x 140′; W. L. Atkinson, contractor.

Buttonwood St., No. 908, three-st'y carpenter-shop, 20′ x 50′; Thos. F. Shuster, Jr., owner.

Clark St., bet. Twenty-sixth and Twenty-seventh Sts., 2 two-st'y dwells., 14′ x 36′; Jas. Hagan, owner.

Virginia St., w of Trenton R. R., three-st'y factory, 43′ x 143′; Dickson Bros., contractors.

Fifth St., n of Indiana Ave., 7 two-st'y dwells., 16′ x 46′; S. R. Stewart, contractor.

Cumberland St., bet. Eighth and Ninth Sts., 16 two-st'y and 4 three-st'y dwells.; T. W. Smaltz, owner.

Fifteenth St., n of Wharton St., three-st'y dwell., 18′ x 60′; Alex. Beck, owner.

Tulip St., n of Tioga St., two-st'y dwell., 15′ x 30′; Wm. M. Kenney, owner.

Germantown Road, n of Clearfield St., two-st'y dwell., 17′ x 40′; Jno. Donnelly, owner.

Randolph St., n of Columbia Ave., four-st'y morocco factory, 20′ x 85′; W. Bartholomew, contractor.

Township Lane, cor. Nice St., two-st'y dwell., 16′ x 42′; T. W. Wright & Sons, contractors.

Edgemont St., n of Somerset St., two-st'y dwell., 20′ x 31′; Slater & Miller, contractors.

Chancellor St., Nos. 1634 *and* 1636, four-st'y stable, 30′ x 60′; D. McDaniles, owner.

Chester Ave., cor. Forty-eighth St., three-st'y dwell., 20′ x 54′; J. D. Arthur, contractor.

Venango St., e of Tulip St., two-st'y dwell., 16′ x 32′; Max Wilber, owner.

Bethlehem Pike, below Reading R. R., three-st'y stone house, 40′ x 100′; E. Thompson, contractor.

Thirty-first St., cor. Clearfield St., three-st'y dwell., 18′ x 47′; Chas. Bartle, contractor.

Thirty-fifth St., cor. Scott Lane, two-st'y dwell., 15′ x 45′; Chas. Bartle, contractor.

Fitzwater St., s of Twenty-first St., three-st'y dwell., 16′ x 45′; McFetridge & McConnell, contractors.

HOUSE.—Jno. Scott will erect a house at Thirty-eighth St., cor of Chestnut St.; from plans by Wilson Bros. & Co., architects.

St. Louis.

BUILDING PERMITS.—Seventy-seven permits have been issued since our last report, twenty-seven of which are for unimportant frame houses. Of the rest, those worth $2,500 and over are as follows:—

A. Whri, two-st'y brick dwell.; cost, $6,000; A. Whri, contractor.

Mrs. A. Kappresser, two-st'y brick tenement; cost, $2,500; Paulus & Weidemuller, contractors.

M. Doyle, two-st'y brick tenement; cost, $2,800; M. Doyle, contractor.

Fred Werner, two-st'y brick dwell.; cost, $3,800; McCarty & Watzon, contractors.

P. Finan, 2 adjacent two-st'y dwells.; cost, $3,200; Bryan & Brady, contractors.

J. C. Crothers, two-st'y brick dwell.; cost, $2,650; J. A. Stanley, contractor.

St. Louis Board of Public Schools, three-st'y brick school-house; cost, $16,975; Grundwald & Wind, contractors.

Jno. Klute, two-st'y brick dwell.; cost, $4,000; Klute & Hillebrand, contractors.

Jno. Klute, two-st'y brick dwell.; cost, $4,000; Klute & Hillebrand, contractors.

Aug. Vitrey, two-st'y brick dwell.; cost, $4,000; Klute & Hillebrand, contractors.

Jno. Ehrhardt, 3 adjacent two-st'y tenements; cost, $6,500; Frank Hermann, contractor.

Mrs. B. Koenig, 3 adjacent two-st'y tenements; cost, $6,500; Henry Rocklage, contractor.

Mr. Wotle, 2 adjacent two-st'y dwells.; cost, $2,550; J. C. Schubert, contractor.

G. Wurtz, two-st'y brick dwell.; cost, $3,000; A. Anderson, contractor.

Wm. Desmond, two-st'y brick dwell.; cost, $3,000; Craegen & O'Brien, contractors.

Louis Kuebler, two-st'y brick dwell.; cost, $2,500; Hermann & Schumacher, contractors.

Caul & Hasse, two-st'y brick carriage factory; cost, $20,000; A. Beinke & Co., architect; E. T. Hoffman, contractor.

Toledo.

ASYLUM.—Messrs. Malone & Co., are now well begun on their large asylum contract, and the work will be pushed as vigorously as the coming fall and winter weather will permit.

It is expected that a number of the buildings will be enclosed before snow falls.

MEMORIAL BUILDING.—The foundation and basement walls of the Soldier's Memorial Building, cor. Adams and Ontario Sts., are completed, and are a very fine piece of work; the cut-stone being furnished and set by Mr. Geo. Driver, reflecting great credit upon his skill.

The City Council have just approved the contract entered into by Messrs. Dawson & Anderson, for enclosing the structure; Hunter Bros., having the contract for the brick work. The cost for the enclosing, above the basement, will be upwards of $22,000; and it is expected the work will proceed at once. The plans were prepared at the office of Gibbs & Co., of this city, and the structure gives the promise of being very effective, and an ornament to the city.

STABLE.—Cor. Madison and Twenty-third Sts., brick stable, for Mr. H. S. Walbridge; cost, about $3,000; N. B. Bacon, architect; Platfoot & Co., builders.

WAREHOUSE.—Five-st'y brick wholesale building, with basement, for Mr. D. R. Locke ("Nasby"), adjoining new *Blade* building. The building is 30′ front on Superior St., by a depth of 114′ to alley. This is intersected by a building having frontage of 40′ on Jefferson St., and a depth of about 90′; N. B. Bacon, architect; J. V. Sanfleet has the contract. The cost to be about $32,000; and will be finished March 15, 1885.

HOUSES.—Mr. A. Burger is having constructed on Adams St., a Queen Anne frame dwell., to cost about $3,500; from plans by Mr. F. Eurich.

Mr. H. W. Barkdull is having constructed a frame dwell., costing about $3,000; from plans by Messrs. Gibbs & Co.

Mr. W. Hodge, cor. Warren and Prescott Sts., frame dwell., costing about $3,200; E. H. Kuhlman, builder.

General Notes.

ALGONA, IO.—Two-st'y brick school-building; Foster & Liebbe, architects; cost, $16,000.

AMES, IO.—Buildings for State Agricultural College.

BEACH HAVEN, N. J.—Cottage for Jno. Converse; Wilson Bros. & Co., architects, Philadelphia, Pa.

BOOMER, IO.—Webb, Moore & Miller, brick business block, four fronts; Foster & Liebbe, architects; cost, $20,000.

Hotel, three-st'y; Foster & Liebbe, architects, cost, $16,000.

BUFFALO, N. Y.—For the Young Men's Library and Art Society a building, with a frontage of 307′, with a depth of 50′, of Philadelphia brick with brown-stone and terra-cotta trimmings, is to be built at a cost of $225,000, from designs of Mr. Cyrus L. W. Eidlitz, of New York.

CAUSO, N. S.—Office, operating station, and several dwells.; Edward Chester Smith, architect.

CEDAR RAPIDS, IO.—Masonic library-building, brick and stone; Foster & Liebbe, architects; cost, $25,000.

CHARLES CITY, IO.—A. G. Case, two-st'y frame dwell. Foster & Liebbe, architects; cost, $7,500.

C. H. Baldwin, two-st'y frame house; Foster & Liebbe, architects; cost, $4,500.

GRINNELL, IO.—H. L. Spencer, two-st'y business block, frame; Foster & Liebbe, architects; cost, $4,500.

C. H. Beyer, two-st'y frame house; Foster & Liebbie, architects; cost, $4,500.

GUTHRIE CENTRE, IO.—Col. Dewey, two-st'y frame house; Foster & Liebbie, architects; cost, $5,000.

HARLAN, IO.—C. Escher, two-st'y frame house; Foster & Liebbe, architects; cost, $5,000.

KANSAS CITY., MO.—Ermine Case, Jr., brick residence, 48′ x 120′, two-st'y, 1222-1224 Broadway; cost, $7,500.

I. F. Richards, business block, 40′ x 106′, four-st'y and basement, 1329-1331 Union St.; cost, $15,000.

Foster & Liebbe, architects; cost, $25,000.

MINNEAPOLIS, MINN.—Irving A. Spear, two-st'y wooden dwell., n cor. Fifteenth Ave., s e, and Sixth St.; cost, $3,000.

Mark D. Spear, two-st'y wooden dwell., s e cor. Stevens Ave. and Thirty-second St.; cost, $3,000.

J. D. Blake, two-and-one-half-st'y brick veneered dwell., Mount Curve Ave., cor. Groveland and Twenty-third Sts.; cost, $25,000.

H. W. Phelps, four-st'y brick warehouse, 57′ x 62′, s s of First Ave., north, between Washington Ave. and Second St.; cost, $20,000.

A. Von Ende, four-st'y brick and stone building, 55′ x 75′, w s of High St., between Hennepin and First Aves.; cost, $20,000.

Jos. Boswell and W. Vaughan, frame dwell., First Ave., s.; cost, $3,000.

MONTCLAIR, N. J.—A frame Sunday-school building is to be built from plans of Mr. C. D. Marvin, of New York.

MUNCIE, IND.—The contract for the building of a new court-house will be let Thursday, September 4. The building will be of stone externally, constructed of iron, and thoroughly fire-proof. It will be a first-class building in every respect. The architect is B. S. Tolan (successor to T. J. Tolan & Son), of Ft. Wayne, Ind.

MUSCATINE, IO.—P. M. Musser, brick residence, three-st'y; Foster & Liebbe, architects; cost, $20,000.

MUSKEGON, MICH.—Chas. Van Sickle, wood dwell.; cost, $2,000; D. S. Hopkins, Grand Rapids, Mich., architect.

PROPOSALS.

JOINER'S WORK AND WOOD FLOORING.
[At Kansas City, Mo.]

OFFICE OF SUPERVISING ARCHITECT,
TREASURY DEPARTMENT,
WASHINGTON, D. C., September 17, 1884.

Sealed proposals will be received at this office **until 2 P.M., on the 15th day of October, 1884,** for furnishing and fixing in place complete, all the joiner's work and wood flooring required for the custom-house and post-office building at Kansas City, Mo., in accordance with drawings and specification, copies of which and any additional information may be had on application at this office, or the office of the superintendent.

Bids must be accompanied by a certified check, and those received after the time of opening will not be considered.

M. E. BELL,
458 Supervising Architect.

COURT-HOUSE.
[At Galesburg, Ill.]

OFFICE OF THE COUNTY CLERK,
GALESBURG, ILL., September 11, 1884.

Sealed proposals will be received at this office **till 11 o'clock, A. M., on the 3d day of October, 1884,** for supplying all materials and workmanship, and completing every class of work required in the construction of the new court-house at Galesburg, Ill., to be erected according to the plans, specifications, and detail drawings of E. E. Myers, architect, which can be seen upon application at this office after the 18th inst.

Bidders will be required to furnish samples of the several kinds of materials to be used in the construction of the building, and shall inclose with their bids a copy of this "Notice to Contractors and Builders," and also a certified check payable to Knox County, for the sum of $1,000, as a guaranty that the bidder, if successful, shall, within ten days after the award, enter into the contract as required; and a failure to do so within the time specified shall forfeit all claim to said contract and certified check.

The contractor will be required to give bond in the penalty of twenty per cent of his bid, with security to be approved by the Court-House Committee, for the fulfilment of his contract.

Specifications, schedules, forms of proposals and contracts will be furnished upon application to this office.

Bids will be made separately for each class of work, or for the work as a whole, and must be indorsed "Proposals for Building the New Court-House," and be addressed to W. Selden Gale, the Chairman of Building Committee, at Galesburg, Ill., stating the time within which the work bid for shall commence and be finished.

All proposals must be addressed to the undersigned, and no proposal will be considered unless accompanied with a full and complete itemized schedule, and made on the blanks furnished by the county.

The Court-House Committee reserves the right to reject any or all proposals, and to let the work as a whole or separately, as they may deem it best.

W. SELDEN GALE,
457 Chairman of Building Com.

Publishers' Department.

The American Architect and Building News.

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211 TREMONT STREET, BOSTON, MASS.

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New Advertisements.

A. T. STEARNS LUMBER CO. (Boston, Mass.), Cypress Lumber. Page xii.

H. W. JOHNS M'F'G CO. (New York, N. Y.), Asbestos. Page xi.

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WANTED.

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WANTED.

SITUATION. — Wanted, situation, by a competent draughtsman of over fifteen years' experience. Construction and perspective have received special attention. Address, "E.," care *American Architect.* 459

WANTED.

PERMANENT SITUATION. — A skilful and experienced assistant architect and colorist, a man of some culture and travel, wishes a permanent situation. A position with a man of thorough business qualities, who would eventually offer an interest or partnership, if satisfactory, preferred. Address "H. H.," this office. 456

PROPOSALS.

PUMPING-ENGINE.

[At Bowling Green, Ky.]

Sealed proposals, addressed to the undersigned, will be received by the Water Commissioners of Bowling Green, Ky., **until October 15, 1884, at noon,** for furnishing, building, and erecting, complete, one compound condensing steam pumping-engine, of two and one-half million United States gallons' capacity per twenty-four hours, and also for a non-compound condensing engine of like capacity.

Specifications and further information can be obtained from the undersigned, or from Chas. Hermany, the Consulting Engineer, by addressing him at Louisville, Ky. JAS. H. WILKERSON,

458 Supt. Water Works, Bowling Green, Ky.

COURT-HOUSE AND JAIL.

[At St. Clairsville, O.]

AUDITOR'S OFFICE, BELMONT COUNTY, }
ST. CLAIRSVILLE, O., September 4, 1884. }

Sealed proposals will be received at the auditor's office, Belmont County, Ohio, from the 4th day of September, to the 6th day of October, 1884, inclusive, **until 1 o'clock,** P. M., of the day last mentioned, for furnishing materials and performing the necessary labor for the erection of a court-house and jail, at St. Clairsville, O.

Each class of work and materials to be separately bid upon, to which may be added a bid for the entire work including materials.

Plans, specifications and bills of material may be seen at the auditor's office, in said county on and after the 4th day of September, 1884, and at the office of J. W. Yost, Architect, 67 South High St., Columbus, O. Each bid must be accompanied with bond equal to 25 per cent of the amount of the bid as a guaranty that if awarded, the contract will be completed, and proper bond given for its completion.

The right to reject any or all bids is reserved.

Blanks will be furnished bidders on request.

458 R. R. BARRETT, Auditor.

ORDNANCE SUPPLIES.

[At Rock Island, Ill.]

ROCK ISLAND ARSENAL, }
ROCK ISLAND, ILL., September 12, 1884. }

Sealed proposals in triplicate, upon the blank forms furnished from this arsenal only, will be received by the undersigned **until 12 o'clock, M., on Thursday, October 16, 1884,** at which time they will be publicly opened, for furnishing the following classes of supplies, in such quantities and at such times during the fiscal year ending June 30, 1885, as the commanding officer of this arsenal may require, viz.: blankets, forage, bar iron, steel, brass, iron and copper rivets and burs, wire, nails, leather, thread, cotton duck, stationery, paints, oils, etc. All articles will be subjected to a rigid inspection; full compliance with the specifications will be insisted upon, and no articles of inferior quality will be accepted. The Government reserves the right to reject any or all proposals or parts thereof. A preference will be given to articles of domestic production and manufacture, conditions of price and quality being equal. Forms containing instructions to bidders, a copy of this advertisement, blank form of proposals, and specifications for supplies, with column for prices to be filled by the bidder, can be had upon application by mail or in person to the undersigned, and samples of the supplies can be seen at this arsenal.

Envelopes containing proposals should be marked "Proposals for Ordnance Supplies," and addressed to the undersigned.

Bidders are invited to be present at the opening.

D. W. FLAGLER,

458 Lt.-Colonel of Ordnance, Commanding.

PROPOSALS.

CITY-HALL.

[At Richmond, Va.]

CITY ENGINEER'S OFFICE, }
RICHMOND, VA., August 16, 1884. }

Sealed proposals are invited **until October 1 next, at 6 o'clock,** P. M., for building a new city-hall at Richmond, Va.

Drawings, specifications, and printed forms can be seen at this office.

The Committee on Grounds and Buildings reserves the right to reject any and all bids.

For further information apply to the undersigned.

W. E. CUTSHAW,

457 City Engineer.

DAM.

[Near Frankfort, Ky.]

U. S. ENGINEER OFFICE, 82 WEST THIRD ST., }
CINCINNATI, O., September 1, 1884. }

Sealed proposals, in triplicate, will be received at this office **until noon, local time, on Monday, October 20, 1884,** for furnishing all materials and labor for constructing Dam No. 5, Kentucky River, about seventeen miles above Frankfort, Ky.

Approximate estimate of materials: —

126,764 lineal feet of timber,
96,000 pounds of iron, drift-bolts and spikes,
8,350 pounds of iron anchoring-bolts,
19,000 cubic yards of rip-rap stone,
352,588 feet B. M. of sheeting,
6,000 cubic yards of gravel backing.

Specifications, printed forms of proposals, and information will be furnished on application to D. L. Sublett, at Frankfort, Ky., or to the undersigned.

459 JAMES C. POST, Captain of Engineers.

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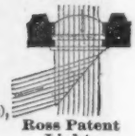

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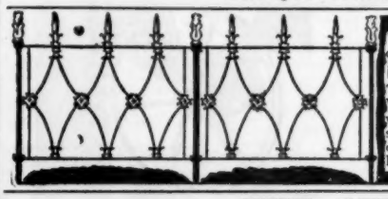

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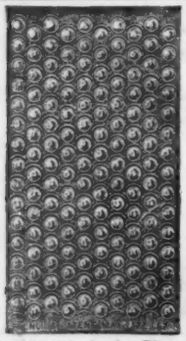

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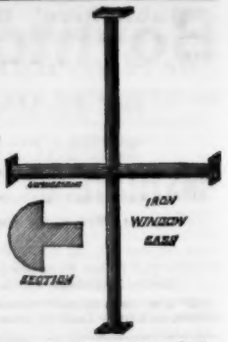

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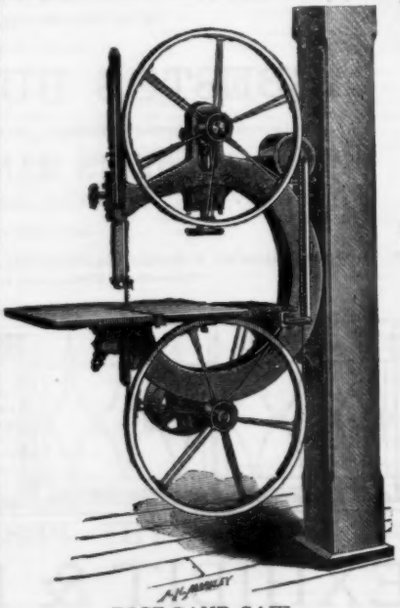

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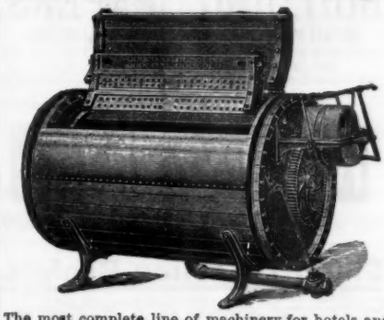

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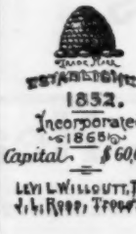

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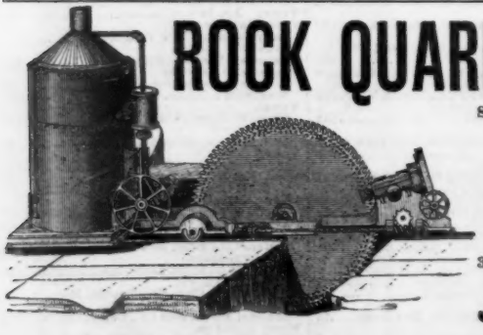

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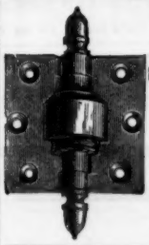

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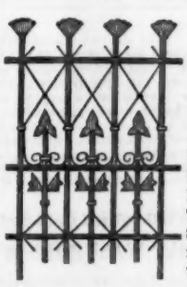

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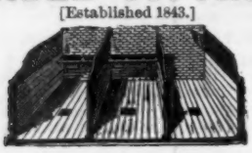

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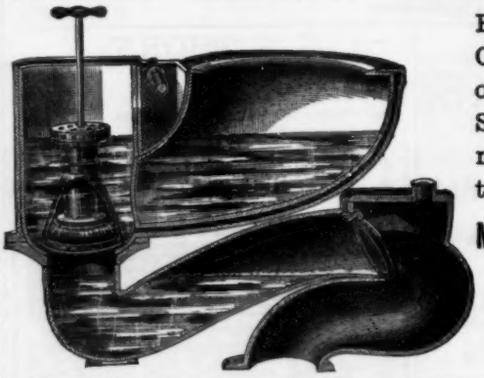

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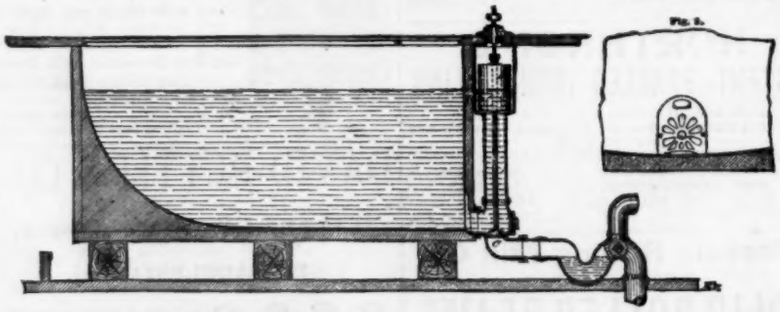

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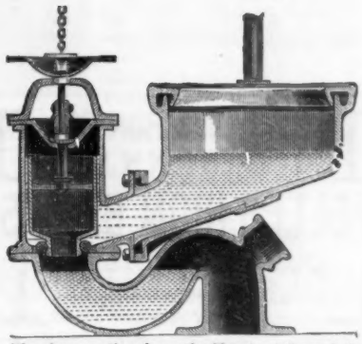

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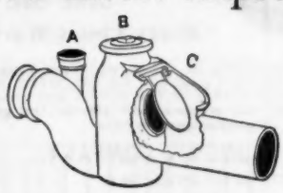

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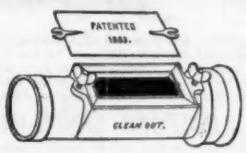

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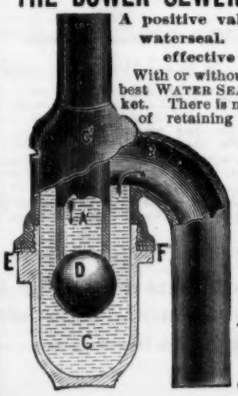

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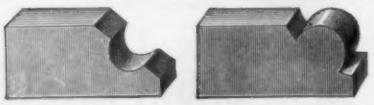

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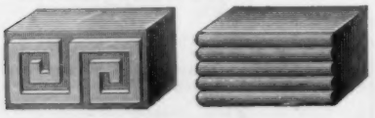

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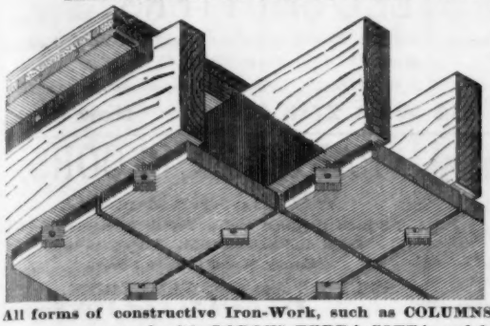
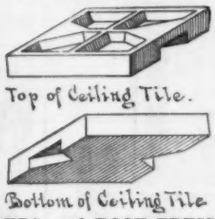


500000 feet of this ceiling have been put up in Chicago, Milwaukee and Cleveland, and it is now being put in the American Bank-Note building, New York.



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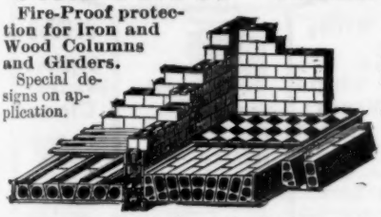

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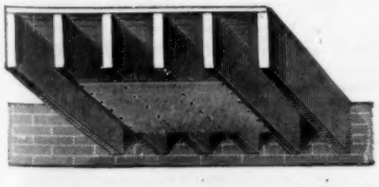

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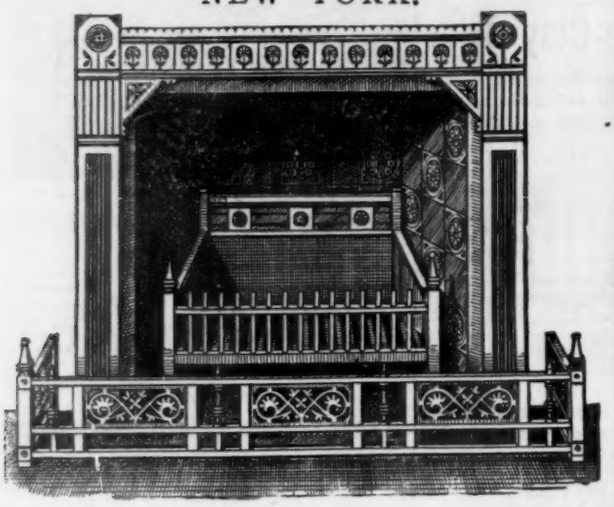

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